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A Vocabulary of the Scindee Language. By CAPT. J. B EASTWICK, *Assistant Political Agent, Upper Scinde. From the Political Secretariat of the Government of India.*

It is some months ago since we were favoured by the Government of India with the copious Vocabulary which forms the subject of the present article; and it would have earlier been sent to press had we not placed it in the hands of our learned associate Dr. Hæberlin, from whom we hoped to have obtained some philological remarks upon this curious dialect, which seems to form the link between the languages of Western India, and those to the North-West and West of it. In this hope we have however unfortunately been disappointed, Dr. Hæberlin's ill health obliging him to quit Calcutta for a time; and political events rendering the publication of the Vocabulary now of urgency, we have therefore lost no time in obtaining the MSS from the hands of Dr. Hæberlin's agent, and hurrying it through the press. We should also state, in justice to Captain Eastwick's invaluable labours, that in the MSS. each Scindee word is also written down in the native character;* but having no fount of types of this, we have been compelled to omit what would otherwise have rendered it so much more complete. As it now stands, however, it is a noble foundation for a complete Dictionary of the language, and with Mr. Wathen's Grammar of the Scinde Language, of which a notice will be found at p. 347, vol. VI. of our Jour- [illegible] Lieut. Leech's Epitome of the Brahooi and Baloochi Languages, [illegible] monument of those patient labours by which Englishmen have [illegible]bly aided to build up and to consolidate the influence and [illegible] their country in the East, while they advance the cause of [illegible] and the interests of humanity.—H. P.

[illegible] a mixture of Guzerattee, Tamul, and Malayalim (?) or a corrupted [illegible] Mr. Jas. Prinsep

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English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar.
Abandon, to	chha diyan	choran.	Account	lekho, hisab	khando.	Along, with	gad, san	
Abandoned	sunco [jan	sung.	Accuse, to	daira bandhan		Allowance	seedho, wiran	
Abase, to	martabo cahee vi-		Accusation	gila.*f.* pachar,*m*		Already	hane	
Abate, to	khutan }		Acid	khatto		Also	whee	
———	ghat karan }		Acquainted, to be	sunyanan	mahit thiyan.	Always	sada	nit.
Abhorrence	kirb	ghin.	Across	hoona bhar	adr, *par.*	Ambition		dhun.*f.*
Ability	sagh }		Action	halat kam		Among	wich, men	
———	was }		Active	bhar	janjro.	And	oun, biyo	
Able, to be	saghan		Accustom, to	heran		Angry	damar, kawar	
Abode	tikans		Accomplish, to	nibahan		Another	biyo	
Abolish, to	badhkaran		Add, to	jumlo karan		Answer	waranee, jawab	
Abortion	bharkiran		Adhere, to	chimbran	chahontan.	Ant	makoro, udaee	
About	wejho }	khanhar.	Adept	ustad	jin.	Any	jeko	
———	chondares }		Adjoin, to	gadd thiyan		Antimony	surma	soyiro.
Above	te		Adulteress	lach,char		Arm	banh	
———	mathe		Adult	baligh		Army	lashkar, katak	
Abroad	bahar		Adultery	zina		Arrogance		bhan,*m.*
Abscess	pohree	kino.	Advice	gantee, salah	mat,*f.*	Arch	jaro	
Absence	na, achan	wej.	Advise, to	salah diyan	ach, han.	Applause	sarah	jas.
———			Afoot	perin, piyado		Appear, to	sujan	
Abstemious	satewan		Afraid	drijnun		Architect	od, rajho	
———	pahrez		After	poi		Arrange, to	sudharan, thahan	
Absurd	beja galh		Afternoon	poiarry	aggin.	Arrangement	sola	rith.
———			Again	poimoti, waree		Alligator	wago	
Abundant	ghano		Age	jamar wahi		Almond	badam	
Abuse	gar		Agent	whaiwaree		Apple	soof	
Ablution	maso		Agreement	waido	laman.	Aperient	julab	
Accept	sakaran		Ague	thadd	siyo.	Arrive, to	ponchan	rasan.
———	manyan		Aid, to	hath rakhan		Arrow	kan, teer	gaz.
Accident	ochto		Air	wa		Armpit	kach,h	
Acclivity	charee		All	sabhe mire		As	jiyen	
Accompany, to	gadjee halan		Alone	heklo		Ashes	rakh	ch,hayi.
Accomplice	hamrahee		Alike	jiho, jero		Apprize, to	chitayan	janaya.
Accord, with one	gadjee		Alimony	daj	dej.	Assafœtida	hing	

English.	Dialect of Sar.	Dialect of Lar.
Ask, to	puchhan, goran	
Asleep	sumeo, suto	
Ass	gadho, koten	
Assistance	madad, wah	
Assistant	hamrah	wahru.
Assembly	majlis	sobha.
At leisure	palo	
Attendant	khashkailee	kaujkee.
Awake	jago	
Aware, to be	chetan	
Avarice	loth	jufo. [piyo.
Away		ghorio, khar-
Away with him		hayo.
Away, far	parr, agahun	
Aunt, maternal	masee, mamee	
Aunt, paternal	phuphee, chachee	
Abstain, to	wat rakhan	
Ancle	muru, goro	
Area	angan	
Babe	bar, balak	gabhur.
Back	puth	
Backwards	puthiyan	
Bad	buch,hro	
Baffle, to	namumed karan	
Bag	gothree, boro	khiso.
Bag for horses	tobro	
Baggage	madee	walla.
Bail	jamin	
Bait, to	atto layan	
Bajree	bajar	[karee.
Balance	tarazu, kanto	simee, tra-
Balcony	baithak	
Bald	gaujo	
Bale	bhujko	gandre.
Ball	goree	
Bamboo	bans	
Ballot or Subscription	pukha, pattee	dharo, chando.
Bamboozle, to	ghusayan	
Bandage	pattee paho	
Baneful	wih	
Banyan	wanyo	
Banish, to	pardes karan	
Bank	bhar kandee	
Bankrupt	dewalo	
Bar	dak	
Barber	hajam, naee	
Bare	uqharo, oojar	oojar.
Bargain	hod, shart	
Bark	chhodo	
Barley	jau	
Barren	kabrateen	pachhar.
Base	kameeno	pajee.
Bashful	sharmindo	
Basket	kharee, chhabo	dallo.
Bason	chilamchee	
Bastard	haramjado	
Bathe, to	wenjhan	shuan karan.
Bat	chamro	
Bead	dano	
Beak	chumbh	[ran.
Bend, to	nurayan	dingee ka-
Be, to	thujan, huwan	
Beam	shahteer	kam.
Beau	matar [sahan	
Bear	rich,h (to bear)	
Bear, to (a child)	wiyaman	
Beard	daree	sunlauree.
Bearer	kahar	
Beast	miru [chango	
Best	change khon	
Beautiful	sohno	sutro.
Because	hinakan [wan	
Become, to	thiyan, thi pa-	
Bed	hand, sejband	
Bee	makhee, jindan	
Beef	gaoomah	
Beetle nut	japhar	
Bazar	bazaar	
Before	age, agle	[naro.
Beggar	lango	penar maug-
Begin, to	lagan	
Behind	puthiyan, poite	
Belch	ogarayee [han	
Believe, to	munyan, wisa-	
Bell	ghand, ghinu,	
Bellow, to	ramban kuran	
Bellows	dawan	
Belly	peth	
Beloved	pirin	hot.
Below	heth	
Benificence	bhalayee	
Beneficent	subago	
Benevolence	[chango	hot
Best	change kho	
Bet	hod	
Beyond	pare	
Bewail, to	khabardar	
Beware	sufio, pitto	
Bile	hundee	sawon panee.
Bill		tip.

English.	Dialect of Sar.	Dialect of Lar.
Bind, to	bandan	
Bird	pkahi, pakheru	
Birth	japan	
Bird's nest	akheru	
Bit	tukkai, zaro	
Bitch	kuttee	
Bite	chak	
Bite, to	chak payan	
Black	karo	
Blacksmith	lohar [salo	
Blade	phar (of grass,)	
Blame	ch,himb	dorafo, doh.
Blanket	khatto, loi	
Blind	ando, kano	
Blockhead	jat, chareo	
Blood	rat	
Blaze	thibba,	olambo.
Blow	muk	hanano.
Blot	chuto	
Board	pharaho, patr	[dhoondee.
Boat	beree, jhamtee	dingee,
Bodice	angee, kurta	gaj.
Body	ling	juso, dil.
Boil, to	ubhaman	
Blue	mawon	
Bold	wero	
Bone	haddo	
Bond	hujjat	
Book	pothee, kitab	
Bore, to	sal 'karan, toon-	
Bore	toong [gan	
Borrowed	rakat	
Bosom	uralo	
Both	bayee	
Bottle	shisho, bhuttee	
Bottom	taro	
Bow	sing, kaman	
Blow, to	wahan	
Bound	daug	
Bowels	antra	[sunghee.
Box	petee, dablee	(snuffbox,)
Boy	chhokar	
Boast	mark	laharee.
Boatman	muhano	
Boil	pōree	drajee.
Boiled rice	bhat	
Bracelet (of metal)	kangan (of jewels,) bahonto	
Brain	maghz	gudo.
Bramble	kando	
Bran	ch,han, toh	
Branch	taro, dar	lam.
Brass	peetal	
Brave	jorawar	mall.
Breast	bubu	
Break, to	bhanyan	chhijan.
Bread	manee	
Breakfast	neran	
Breath	sah	
Brick	sir	
Bride	kunwauree	
Bridegroom	got	
Bridge	phur, band	
Bribe	lab, rishwat	
Bridle	lagam, wag	
Broad	wekro	
Broom	boharee	
Broth, with meat or tea in it	bor (without the meat,) rahoo	
Broker	dalal	
Bulbul	bhoro	
Brother	bra, addo	
Brotherhood	biradaree	bhipee.
Brown	bhuro, kakho	
Bruise	dakk, rin	rin.
Bud	mukree, gaunel	
Buffalo	mech, paro	
Build, to	jarjoan	adan.
Building		adap.
Bull, (male buffalo)	san dand	
Bullet	goree	
Bullock	dago, dand	
Bullock-bags	khurjin	
Bump	mujo [grapes)	
Bunch	chhugo, (of	
Bundle	gandhree	bharee
Bury, to	puran	datan. [man.
Burn, to	saran	baran, kha-
Burst, to	phatan	
Business	kam, kaj	dando.
Bushy	chajj [achan.	
But	par (for archers)	
Butcher	kasaee	[akhar.
Butter	makhan	buttermilk,
Button	beerre [tan.	
Buy, to	ghinan, mulwa-	
By	san	
Blessing	asis, *f.*	
Brushwood	belo	

English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar.
Bray, to	hingan		Cat	billee	pusee.	Chiefship		jamani.
Breadth of a cloth	bhar		Catch, to	jalan, watan		Child	bar, ningar	
			Cattle	pahrın, dor		Chin	khadee	thodee.
Cackle, to	bang diyan		Cause	karan		Chintz	cheet	
Cage	pinjro		Cautery	dambh		Choice	wanat, rij	gur.
Cake	laddu		Caution	sambhar		Choose, to	guran	
Calamity	bala	jaza.	Cavern	chur	daro.	Churn, to	wiloran	
Calf	gabo, wachh		Cavity	gharo, ber	girkhee.	Cinnamon	dalcheenee	
Caldron	kunno		Cease, to	chhadiyan		Circumcise, to	tohrayan	
Call, to	sadan, kotan		Ceremony	reet, melo		Circumcision	tohar	
Calling	kast, hunr	nado.	Certain	dilsan layee,		Circuit	ghher	kundree.
Camel	utt (neeklace,)	lero, boro.	Chaff	toh [takrar		City	nagai, shahr	dero.
Camphire	kapur [kandee		Chain	nel		Claim	dawo	janjal.
Candle	diyo		Chair	manjee	gadel.	Clay	garo	
Candlestick	diyatee		Chalk	met	acheemittee.	Clean	ach,ho, nirmal	phutro.
Cane, sugar	kamand, kanu	lakkur.	Chamber	koto		Clean, to	ch,haran	
Cap	topee		Chance	ochto		Clear	chitto	lasso.
Capital city	takht		Change, to	matan		Climb, to	charhan	
Caravan	cafila, saltee		Channel	wah		Clip, to	kataran	
Card to cotton	pinyan		Charcoal (on fire)	angar; (not on		Cloak	labado	munghan.
Carder of cotton	pinyaro			fire) korla		Clock	gharee	
Captive	bandewan		Charge, to	suparish karan		Clod	bhittar	
Care	khabardare		Charm	mantar (of snakes)		Clothes	kapra	latta.
Careful	samjarwaro			mantr		Cloth	waggo, gandee	
Cardamoms	phonts		Chaste	pak, sutr	sukkhar.	Cloud	kakkar	
Carpenter	wadho, drakan		Cheap	sahngo	kasrato.	Cloudiness	jur	ghin.
Carpet	gilim,		Cheapness	sahngaee	moree.	Clove	laung	
Carrion	dhoond, murdo		Cheat	makrel, teelalee		Cloyed, to be	drapan	
Carry, to	niyan		Check	gilto		Coat	giddee	kurtee.
Carrot	gajur		Cheek	churan		Club	ghobtee, lath	dhuko.
Cart	gadee		Chew to	chaban	kulran.	Cock	kukkur	
Case	gotree, posh		Chew to (the end)	ogaran		Coffee	kaho	
Cash	rok, tako		Chick	kukurjo bacho		Cold (a cold)	(les) thaddo	
Cataplasm	lupree		Chief	sirkardo, wadero				

English.	Dialect of Sar.	Dialect of Lar.
Cluster of grapes	chugo, (of dates) gosho	
Color	rang	waran.
Comb	phanee	
Come, to	achan, rason	rasan.
Companion	sathee	sangtee.
Complaint	danh	
Complete	puro	
Compliments	salam	
Consent, to	mauyan	basan.
Conversation	galhayan	charcho.
Consideration	wichar	
Company at a marriage	jhanj	
Counterfeit	wes (*m*)	
Contract	waido	muddo.
Cook, to	randan	joran.
Copper	tramon	
Coppersmith	thantharo	
Copulate, to	jahan	
Copy	utaro	
Correct	theek	siddo, kharo
Corpse	murdo	marh.
Cottage	landee	bhungo.
Cotton	kapah	
Cotton spinner	koree	
Cover	dhakan	ralee, sawar
Cover, to	dhakan	butan.
Cough, to	khangan	
Count, to	ganan	lekhan.
Country	bhun	deh.
Court	kacharee	damkhano.
Courage		hiwan.
Cousin	sautr	
Covenant	koul	

English.	Dialect of Sar.	Dialect of Lar.
Covetous	lobhee	
Cow	gaun	
Coward	dujanwaro	khadro.
Crack	chir	
Cradle	pingo	
Craft	kasb	kirt.
Cramp	wakar	
Cream	thar	kunj.
Create, to	khalkan	
Creator	khalik	
Credit	nang	
Creek	khadee	
Creep, to	petabhar wanyan	
Cross	baunee, baree	
Cross	tikko, tund	
Crow	kaw [mer	
Crowd	melo, (of troops)	
Cruel	dado, berahm	katar.
Crumb	bhor	
Crumble, to	bhoran	
Crush, to	mahtan	
Cry, to	kukan	ruan. [bro.
Cry	kuk	hakal, kha-
Cumin	wudf, roomee	
Cultivate, to	pokhan	
Cultivation	pokh	
Curdled	dudh, dhoro	
Cushion	gaddee	
Curse	parato	bhundo.
Custom	dastoor, parwez	
Cure	chhuto	
Curl	choona, lona	
Current	seer	
Curious	sukree	
Cut, to	wadan, kapan	

English.	Dialect of Sar.	Dialect of Lar.
Cut	chuto	
Cubit	hath	
Cucumber	badrang	
Conceited, to be	likan	
Cup of brass or metal	katoro, watto	piyallo.
Curdled milk	doro	
Curtain of a bride	mohro	
Dagger	katee	
Daily	dinho-dinh	
Dance, to	naehan	
Dancing girl	kanjaree	
Damp	alo	
Dare, to	taufik thiyan	
Dash, to	oochhilan	
Dark	andharo, oondaee	
Daub, to	meran	
Date of month	mittee	
Date (fruit)	kark (tree), katal	
Daughter	dhee. niyanee	
Daughter-in-law	noh	
Daughter, grand	dhoitree	
Dawn	pirbhat, asur	pirat.
Day	dinh, pareen, (after-tomorrow)	
Dazzling	chamkando	parchaeen.
Dead	muwo	
Deaf	boro	
Dear in price	mahango	
Dear, beloved	pirin, p,yaree	supurin.
Debt	udharo, karz	
Debtor	karzee	
Deceit	makar, fareb	ghat, dhoko.
Deceive, to	droh dewan	

English.	Dialect of Sar.	Dialect of Lar.
Decision	nibero	
Decay, to	winyayan	
Defeat	bhajan	
Defeat, to	bhajayan	
Defile	soree wat	lakk.
Deer	haran, kotapacha	
Den	ghar, belo	
Dense	gatto	
Derision	thattho	charcho.
Deep	tar	
Delay	chirk	awel, gisar.
Depart, to	ladan	usaa, laūān.
Devil	shaitan	dait.
Devout	khudaje watatesan	
Deny, to	mukran	’alan.
Dew	matr	mak.
Due	puro	
Decrease, to	ghatan	
Devote, to	ghoran	
Deficient	kaso, gat	
Definite	nistunk	
Deserted	sunyo	
Detail	wichur, wigit	
Die, to	maran	
Difference	pher	
Difficult	aukhe	aulo, kathan
Dig, to	khōtran	
Dirt	gap, mittee	
Direct, to		dasan.
Direction	sirnamo	
Disgusted, to be	nakhoosh fhiyan	rugan.
Dish	dhanku, thalee	
Dismount, to	lahan	
Distress	chabh	mhat.

English.	Dialect of Sar.	Dialect of Lar.
Distribute, to	wirahan	
Dishonor	bramanee	karayee.
Dress of honor	pabrayan	
Drink, to	piyan	
District	pargano	
Distance	dur, pand	wecho.
Dive, to	tubbee diyan	
Diversion	rand	guman.
Ditch	khahre	
Drum	dhol	
Drunk	mast	
Do, to	karan	
Doctor	tabeeb, waid	waid.
Dog	kutto	
Doubt	ma, mata	
Door	darwajo	dar.
Double	bino	bitto.
Drop	tepo, churako	chhándo.
Drop, to	triman	chuwan.
Dry	sukho	
Dyer	khatree	
Dye, to (the beard)	kes layan (cloth) rangayan	
Doze, to	ojhrakee thiyan	ojhran.
Draw, to	chikan	gilan.
Dough	atto, goto	
Dung (of a horse)	lid (of a cow) chheynu	
Dewlap	phipher	
(Dalbergia sisu) or sheesham tree*	talee	sinjee.
Each	hekro	
Eagle	ukab	

English.	Dialect of Sar.	Dialect of Lar.
Early	sawele, dhakee	pirbhatee.
Ear	kan.	
Earring	boondro, bilero,	lurko.
Earth	mittee	
East	obar	obrando.
Easy	saukho	sahaujo, sukho.
Ebb and flow	war charhanoun lahan	
Eddy	kun	
Edge	mouh	
Egg	ano	
Eight	ath	
Elbow	irk	thunth.
Elk	goin	
Elephant	hathee	
Embezzle, to	khaee wanyan	
Empty	sakhuo	thallo.
Embrace	bhakur	
End	matho	siro, ant.
Envy	rishk	
Enter, to	paihan	ghiran.
Enemy	weree	
Enchantment	jhar, kaman	
Enough	ghano, bas	jajo.
Enquire, to	golan	
Epilepsy	maree	
Entrails	ojree	
Emerald	panno	
Eradicate	patau	upatan.
Erase, to	khotran	
Estimate, to	kathan	
Evening	saujee	
Ever	kadhin	hadd.
Every	jeko	

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* The Sissor.—*Ed.*

English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar.
Evidence	shahid		Farm	pokh	khet.	First	pehro	
Examine, to	parkhhan		Farmer	rahak		First	muk	
Exchange, to	matun		Fast (swift)	takro, rogo (ceas-		Fire, to	bandukhanan	
Excuse	bahano, gusayan			ing from food)		Fire, to set	bah diyan	
Exceed, to	wadan		Fastening	silar	[ro.	Fireplace	chul	
Exchange, in	para	paran.	Fat	thullo	matto, mota	Fiery	trund	
Exercise	dand, istimal	dakh,hro.	Fatness	charbee	wah.	Fish	machhee	
Except	waràec	dháran.	Fatal	halakee		Fish, kind of	pallo, dambro	
Exhaust, to	khalee karan		Fate	kismat		Fit, to		thahan.
Expense	kh,harch		Father	babo, piya		Fit	laik	
Extinguish, to	ujaman	wisahan.	Father-in-law	sohro		Flate	sawon	
Ewe	ghetee, dumbee		Father, grand	nano, dado		Flattery	khushamad	
Eunuch	hijro	khojo.	Fault	doh, bhul	chuk.	Flatulent	wayee	
Eye	ak		Faulter, to	hakka paran		Flax	mung	wan.
Eyebrow	bhirun		Fear	drij, bhau	dap.	Flea	moongan	
Eyelash	pimbree		Fear, to	drijhan		Flee, to	bhajhhan	
Eyeball	wanee	taro.	Ferry	langan		Fleece	bhendejee khal	
Equal	surto, fedo		Fertile	kuwatwaree		Flesh	gosht	mah.
Expended, to be	khajan		Feather	kh,hambh		Flexible	kuaree	
Evening prayers	somanee		Feed, to	kharayan		Flay, to	khal layan	
Earring	panro		Felicity	khushee	rijh.	Flint	pahnee	pattru.
Ear of corn	sang		Female	madee		Float, to	taran	
			Fetid	gando	kinno.	Flock	dhan	
Face	munh		Fever	sap	baro.	Floor	ch,hat	
Fade, to	kumano thiyan		Fig	anjeer		Flour	atto	
Fail, to	moradakhe na		Fine	ucho		Flow, to	wahan	
	ponchan		Finally	akhir	net. [ran	Fortunate	bhag bhareo	
Faint	hino, besudh		Finished, to be	niberan	chukan, su-	Flower	gul, phool	
False	kur	jutho.	Fight	jhero, jang		Foam	gajee, gat	gag.
Fallow	wisanee		Fight, to	wiran		Fold, to	wiran	
Family	kurm	kutum.	Fill, to	bharan	[payan	Food	khayan, khaj	
Famine	dukal	kal, awasar	Find, to	milan, labhan	ladan, pir-	Formerly	agato, aguno	
Faith	bawar, deen		Finger	angur		Fly	makh	
Far	pare, agahun		Finish, to	puro karan		Fly, to	udaman	
Farrier	nalband		Fire	bah	jando, jero.	Forged	khotee	

English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar.
Fool	jat, chareo		Grandfather	dado, nano		Green	sawon, sai	
Foot	per		Grandmother	dadee, nanee		Greens	sag	
Foot of bed	pangatee	perandee.	Grandson	dhoitr		Grief	dukh	gundar.
Forbid, to	jalan	rokan.	Granddaughter	dhoitree		Grind, to	pihan	
Force	jor		Gratis	muft		Grinding mill	jantro	
Foundation	jar		Grateful	mamnun		Groom	sais	
Fragrant	changee boo		Ginger	sunt		Grow, to	utharan	usran.
Free	ajo, wando	niweklo.	Girdle	patko	boch,han.	Grocer	pansarre	
Fresh	tazo	tatto.	Girth	tang		Gruel	rib, bhat	rub.
Frown	goondee		Give, to	diyan		Guana	goh, kirdee	
Friend	sendo	matr.	Glad	suraho	nihal.	Groin	maro	
Fruit	mewo		Glassware	shisho, ahree	kach.	Groan	sas	
Fuel	kattee		Glove	dastano		Gain	nafo	khatteo.
For	lai	karnee.	Glow, to	tapan		Guard	choukee	
Foreign	paraho	parawo.	Go, to	wanyan, halan	usan.	Goglet	dullo	dillee.
Forehead	kapar	nirar.	Goat	chhelo, bakree		Gun	dambuk top	banduck.
Forget, to	wisran	bhulan.	God	dhanee, allah		Gunpowder	darun	barut
Forgive, to	ch,hadan		Gold	son		Guide	suhim	saiee agwan.
Fort	garee	kot.	Good	chango, mocharo		Guess	atkal	
Fortune	bhag		Goodness	changayee		Guest	mehman	
Fowl	kukur		Grain	dano, ann	kana.	Grunt, to	rambha kawan	
Fox	lonbhar		Glittering	chimkando [nee				
Fraud	makar		Glue	laee, saras, kham-	gond, beer.	Habit	her	
Frighten, to	drijayan		Goldsmith	sonaro		Hair	war, chotee	jhonto.
Fringe	jalar		Gory	rat san bharro		Half	adh	[thonkan.
Fry, to	bhunyan		Granary	bhando		Hammer	bathearee	to hammer,
Full	bhareo		Gram	chano		Hand	hath, chambu	kar.
Footsteps	rand		Grape	drakh	dakh.	Handful	muth	lap.
Flag	janda		Gourd	tumbo		Handle of sword	kardiyo	
			Grass	gah		Handle of door		karo.
Gambling	juwa		Grave	hadiro, bhuttee	masan.	Handsome	sohno	sutro.
Garden	bagh		Graze, to, v. n.	charan charan, v. a		Hang to, by the neck	phaho diyan	
Gardener	bagayo	arayeen.	Great	waddo				
Garlic	thum		Greasiness	sanbh		Hang up, to	tangan	

English.	Dialect of Sar.	Dialect of Lar.
Happy	sufaho	
Harbour	baudar	
Hatchet	tabar kuharo	
Hard	dado	nund.
Hare	seher	saho
Harst to the taste	kasaro	
Hat	topee	
Hatred	ver	
Head	matho, seesee	
Headman	pagaro	
Headman of a tract	mukkhee	
Headlong	aundo	
Health	khair	khairo khin.
Healthy	chango, bhalo	nimuro.
Heap	dhig	dher.
Hear, to	bundan	siman.
Heart	man, chit	andra, hod.
Heat	taw, garmee	tapash.
Heavy	gauro	nihro.
Heedless	wesuro	hur.
Height	waddare	obhar.
Helpless	wecharo	
Hence	ithan	
Here	edr	ure.
Herdsman	dhanar	gawanr.
Hermit	naugo	
Hiccup	hidkee	
Hide, to	likayan	
Highland		chhappar.
Hill	takkar	dungar.
Hilt	kardiyo	
Hog	suar	
Hollow	sakhno	polo, thallo.

English.	Dialect of Sar.	Dialect of Lar
Holy		sunhanro.
Home	ghar	
Honey	makhee	[ab.
Honor	abroo, nam	naug, naums,
Hoof of an ass	khur	khusree.
Hoof of a horse	sumbh	
Horn	singh	
Horse	ghoro	
Horse cloth	jule	
Horse shoe	nal	
Hot	koso	
Hour	gharee	tatto
House	ghar	
How	kiyen	
How big	kedo	
How many	ketro	
Humidity	alan	
Hunger	bhukh	
Hungry	bhukeo	
Humpbacked	kubr	gukko.
Hump	kuho, thuwo	
Hunt, to	shikar karan	
Hunting, to go	shikar wanyan	
Husband	murs	kand.
Husbandman	kurmee	karee.
Hint	mich	
Hailstones	gareo	
Horse furniture of gold	sonah sauj	
Heel	khuree	
Hogdeer	pharo	
Hedgehog	jaho	
I	ma	awn.

English.	Dialect of Sar.	Dialect of Lar.
If	je, jekachee	
Ice	barf	
Ignorant	jero	gawaur.
Image	tasweer	moort.
Immediately	siggo, takro	jurt.
Imitate, to	reeskaran	
In	mauj, wich	
In any manner	jiyen tiyen	
Impatient	adeero	
Impatience	adeerayee	
Increase, to	waddo thiyan	wadayan.
Infinite	apar	
Inclination	sudh, sik	
Infirm		abhro.
Injury	ghato	
Ink	mas	
Inkstand	mas kupee	
Inquiry	gola, f. putcha, f.	khoj. f.
Inside		kal.
Intention	irado	ichha.
Interest	weyaj, sud	
Intellect		dahap.
Interview	malakat	darsan.
Interruption	ch,her, f.	
Invest, to, with a robe	pahrayan	
Insolent		deeth.
Iron	loh	
Island	doabee, bet	kolabo.
Itch	kharas	khaee.
Ivory	hatheejo dant	
Jackall	giddar	
Jar	mat	

English.	Dialect of Sar.	Dialect of Lar.
Jaw	keyaree	
Jawaree stalk, chopped for cattle	kuttar	
Jawaree	jawar	
Jerk, to	irken hanan	
Jewel	jawahir	
Jeweller	jariyo	
Jest	gabo	
Joke	charcho, thattho	
Journey	safar	
Juice	ras	
Jot	tir, kakh	jaro.
Jump, to	trapan	kudan.
Justice	nean, wichar	achar.
Inundation	bod, let	char.
Infidel	babar, kafir	
Keep, to	rakhan, sambaran	
Key	kunjee	chabee.
Kick, to	lat hanan	
Kid	hulwan	lelro.
Kill, to	maran	kuhan.
Kin	mayitree	siya.
Kinsman	saggo, mitr	
Kindle, to	baran	
King	padshah	
Kiss, to	chuman	
Knapsack	bujko	
Knee	muno	ghutno.
Knife	chako	kap.
Knot	gandh	har.
Know, to	janan	pururan.
Kidney	bugee [hil	
Kite, (of paper)	patang (the bird)	

English.	Dialect of Sar.	Dialect of Lar.
Labour	pohriyo, mehnat	
Labourer	mazoor	
Lad	lasut	lasiyar.
Ladder	charnee, dakan	pawnree.
Lady	beebee, dero	
Lamb	gheto jo bacho	
Lame	mando	langro.
Lame of a hand	tonto	rundo.
Lamp	diyo	
Land paying a 3d to Govt.	batayee	
Land	sukko	[motr
Landholder	jameendar	bhoyon, jha-
Lamentation		dad.
Lane	gillee	ghattee.
Language	bolee	
Last, to	tikan	rahan.
Last year	parsal	
Laugh, to	khilku	
Lazy	thaddo, sust	postee.
Lease	maswar	
Lead	siho	
Lead, to	mouhmen wanyan	
Leaf	pan, pauno	
Lean	dubro, hino	patro.
Learn, to	sikan	
Leather	cham	
Leave	mokal	
Leave, to	ch,hadan	
Leave, to food	obaran	
Leech	jhour	jonk.
Left, (not right)	khabo	(with thigh)
Leg, (foot only)	per	tang, jhang
Leisure	palayee	wandayee.

English.	Dialect of Sar.	Dialect of Lar.
Lemon	limun	
Lend, to	udharo dewan	
Length	wekran	
Leprosy	kor	
Letter	purzo, khat	chitthee.
Level	sawon	
Lesson	sabak	
Lewd	lucho	
Liar	kurho	
Liberality	sakhawat	jod.
Libertine	khoblo	lerpiyo.
Lick, to	chatan	
Lid	dhakan	
Lie	kur	
Life	jee, sah, janam	paran.
Lift, to	khanan	ubhiyaran.
Light	halko	
Light, not dark	sojro	
Light, to	baran	
Lightning	vijj	khewan.
Ice	jehro	
Lime	chuno, gaj	seerec.
Line	liko	
Lining	astar	
Limb	ling	
Little	thoro, nando	
Little man	mandro	dimbro.
Lion	sinh	
Lip	chap	
Living	jero	jiyado.
Live, to	jiyan	
Load	bar	
Lock	kulf, jendro	jaro.
Long	dhriggo	

English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar	English.	Dialect of Sar.	Dialect of Lar.
Look, to	dissan		Master	dhanee, ago		Money	paiso, roko	
Loose, to	chhoran	upatan.	Mat	nukh, togee	parch.	Monday	sumar	
Lose, to	winyayan		Metal of a gun	palito	toro.	Moon	chhandr	
Loss	khot, ghat		Mean	kamino	nich.	Moon light	chhandrko	
Louse	jun		Meaning	morad	arth.	Month	mahino	
Love	piyar, mahabat	neh	Measure, to	mayan	kach, han.	More	waddo	
Low	hethan		Measure of grain	kaso	kach, hino.	Morning	subhaee	
Low	pajee, nich		Medicine	darun	dawa, dabh.	Morsel	tukkar	
Locust	makar		Meet, to	gadjan		Mosque	masit	
Lover	ashik		Melon	gidro, hindano	chhain.	Mother	maee	
Ladle of wood	doee, kafgeer, (of iron)		Melt, to, in water	garan		Motion	lodo	
Lobe of the ear	papree		Melt in fire	pighran		Mouse	kuwo	
Liver	jeru		Memory	sud	sar, surt.	Mound		thallo.
Leg	pinee		Mendicant	jogee	kapri.	Mouth	wat	
Ladle for ghee	kanchhee		Merely	rugo, takt		Mouth of river	gatto	
Lynx	phakaree		Message	neyapo		Mouthful	girah	
Lizard of the Guana kind	goh		Messenger	pandee		Much	ghano, bisear	
			Middle	wich		Mud	gap, garo	
			Midnight	adh rat		Mule	khachar	
Mad	chareo, chitto (as a dog)		Milk	kheer, khareo, kheer, (sour)		Murder	khoon	
Maid	kunwanree					Musk	khasturee	
Make, to	karan	joran.	Milk and water	lassee		Musket	banduk	
Male	nar		Mind	hiya		Musician	kanjar	
Mallet	watahro		Mine	khotr, khan		Mustard	ahur	raee.
Man	maru, murs		Minute	pul		Mistress	mahboob	
Mango	amb		Misery		sos.	Mortar, gun	ookhadee	
Malice	khundrah		Miser	suyon, shum		Mother of wife	sas	
Many	ghano, gach	jajo.	Mirror	arsee, aino		Mother-in-law	ma matrjee	
Manner	rith		Misfortune	nibhag		Mole	tir	
Mare	ghoree, madiyan		Mistake	bhul, chuk		Milt (or spleen)	tiree	
Mark	nishanee		Mistiness		dhundh.	Mustachios	mucha	
Market	bazar		Mix, to	gadayan		Mongoose	nor	
Marriage	wihan, parnun		Mixed, to be		wichhurau.	Maina, (a bird)	kabar	
Marry, to	parniyan		Monastery	dairo	tikano.			

English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar.
Nail, finger	noh, mekh, of iron		Oath	son, sakpak		Owl	chib, chibro	
Naked	ugharo		Obligation	thoro	kan.	Own	panjo	pind.
Name	naw, nalo		Obvious	padro		Overcome, to be	haran	
Narrow	soro		Occupation		uddim.	Obliterate, to	drayan	metan.
Near	wejo, wat	odo.	Ocean	samundr		Other, on	ludro	
Necessary	gurjnee		Of his own accord	panhen				
Necessary, it is	gurje		Often	ghana dinh		Pain	surpir	dukh.
Neck	geechee	kand, guto.	Oil	tel		Painful	dukhee	
Necklace	har		Oilman	chakee	telee.	Paint, to	rangan	chittan, ratan
Need	gurjnee	nikkar.	Ointment	malam		Painting	chitr	
Needle	sui		Old	kuraro	poro.	Painter		kamangar.
Neelgye	rooj		On account of	babat		Palanquin	pálkee	
Neighbour	parecho	parosee.	Once	hekar		Palm	khajee. tiree, (of [hand)	
Neighbourhood	pazo		One	hekro		Palace	maree	
Nephew(brother's [son)	bhatriyo, bhanjo, [(sister's)		Onion	basar		Pan	kanahee, tawon	
Net	jharo		Only	heklo		Pair	joro	
Never	kadhee na	hod na.	Open, to	patan	ukhelan.	Paper	kagar	
New	nawo, koro		Opinion	deeyan	mat.	Parrot	chattu	
News	sama	samachar.	Opium	afeem		Pattern	namuno	
Niece	bhatree bharjee		Opportunity	waro	takro.	Pay	mahino	garmaho
Night	rat		Opposite	samen		Pay, to	paiso diyan	chukayan.
No	na, nahee		Oppression	julm	ander.	Parentage	gharano	
Noise	kuk, bakhero	hulla.	Order	parwano	hukm.	Passage-boat	pattan	
None	ko nahee		Orphan	chhoharo		Pawn	gaho	
Noon	mauj-and	ba pahr.	Ornament	gahnah	maneeah.	Pawn-broker	mahajan	
Nonsense	jakh		Other	biyo		Peace	sulh	parchayo.
Nonsense, to talk	jakh, maran		Origin	bekh, pai	mur, murho	Pease	matar	
North	uttar		Originally	bekhee	murgo.	Peacock	mor	
Nose	nak		Otherwise	nikar		Peahen		del.
Note	chitthee, ruko		Oven	tanoor		Pearl	motee	
Nourish, to	nipayan		Over	par		Peculiar	niro	nisaro.
Now	hane	hinamund.	Overturn, to	lelayan	uthtayan.	Peg	kir	
Numbering	gantee		Outparts	bahraree		Pen	kalam	lekhnee.
Nutmeg	jaeephar		Outside	bahar	chhandis.	People	lok, maru	

English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar.
Pepper	merch	miriyun.	Plough	har		Push, to	ghelan, rerhan	thelan.
Period		tano.	Poison	weh	katal.	Push,	dhak	thabo.
Perhaps	ie, kadhen	mala, shal, mana.	Police office	chabutro		Put, to	rakhan	payan.
Permission	mokal		Polish, to	ghontan	ujaran.	Prickly heat	arayee	
Perplexed	hairan	murhal.	Polisher of guns	winjar		Penitence	gisee	
Perplexity	rolo		Pond	dhand, dubbo	dhoro.	Partridge	tittar	
Person	maru	jano.	Potsherd	thikkar		Pathless	awatar	
Personable		disnun.	Pony	yabu, tattu	doddo	Pity	baj	
Pestle for bhang	dando	mahree, for grain, &c.	Poor	kangal	nimano, wecharo.	Provision for a journey		samar.
Petition	arzee		Pound, to	kuttan		Pick axe	kodar	
Petticoat	paro	ghaghee.	Powder	buro		Pitcher	kaozo	
Pick up, to	chundan		Pour, to	haran, wijhan	nitaran.	Platter	dang	
Pickle	achar		Power	was	sagh.	Perfumer	surehoo	
Piece of cloth	tako, banee, of ground	than.	Praise	wakhar		Pleiades	kateoon	
Pigeon	kabutar		Prawn	gangat		Pus, (corruption)	poon	
Pill	gofee		Prayer	dua		Pox, small	seyar	
Pillar	thamb	thunee.	Prevent, to	jhalan	taran.	Palm of hand	taree	
Pilgrimage	jearat	jatr.	Present	sukhree	dhono.	Paralytic	mando	
Pillow	wihano		Present	hazir		Penguin	peean	
Pipe	nari		Presence		muhar.			
Pipe for smoking	hukko	chilam.	Press, to	daban, nipuran	peeran.	Quadruped		whaitr.
Pistol	tufancho		Price	mul, agh	baha.	Quarrel, to	wiran	
Place	jaee, kand		Priming	ranjak		Quarrel	jhero	bakhero.
Plain, (clear)	pat		Prison	chabutro		Quarrelsome	weru	
Plaintain	kevrejee pharee	pharo.	Prisoner	bandee		Quarter of a rupee	pawlo	
Plaster	lep	malam.	Privy	pui		Quarter, (direction)	dis	
Plaster, to	layan	limban.	Profit	labh	parapat.			
Plate	rikabee	patr.	Pride		akar.	Question	puchha	
Plate, covered	dhanku		Publish, to	hulayan		Quicksilver	paro	
Play	rand		Pull, to	chhikan		Quiet	math	
Play, to	rand karan		Pen	kanee	jugat.	Quiet	mathiko	
Plunder	phurh, lut		Punishment	saja	sikhaman.	Quiet	mathkar	
Packet	gothree	khiso.	Pupil	chelo				
Plain dealer	wesurah		Purposely	jhanee, bujee		Rabbit	seher	saho.

English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar.
Rain	minh		Repose	aram	sui.	Sack	boro	
Rain, to	minh payan	wasan.	Reprimand, to	ghurkan	tawaran.	Saddle	hauno, katro	
Raise, to	uthiyaran		Reproach	drapo	ubhalo.	Saddle of camel	kajawo	pakro.
Raisins	drakh		Reputation	bharam	sakh.	Sail	sir	
Rascal	haramjado		Return, to	waran	motan.	Sailor	muhano	
Rat	kuwo		Rib	pausree		Salt, (Salt drier)	lun (nonaree)	
Razor	pakee		Rice	chawar		Saltpetre	soro	
Read, to	parhan	wanchan.	Rich	hundwaro	whaiyin.	Sand	waree	
Ready	taiyar		Riches	kund,		Sash	lungee	
Ready, to be	sambran		Riddance	bacha		Saffron	kesar	
Real	sat		Ride, to	ghore te charhan		Save, to	bachayan	
Reason	sabab	karan.	Right	sajho, theek		Say, to	chawan, puchan.	
Receive, to	watan, ginan	rasan.	Ring, (with a	moondree chattee		Scabbard	khip	
Recompence, to	rijayan		stone)	(do plain)		Scaldhead	ganjo	
Recommendation	parat	sefaras.	Ringworm	datr	dadh.	Scales	trakree	tarazu.
Rear, to	nipayan		Ripe	pakko		Scales of a fish	chhittar	
Rear, to (as a			Rise, to	uthiyan		Scarce	thoro	kaulo.
horse).	shekathee thiyan	nira kharan.	River	darya, wah	kasee.	Scholar	khutabee	
Rectitude	sachayee		Rob, to	phoran	choran.	School	maktab	khutab
Recollection	sambhar		Robber	phoru, chor	khosan.	Scissors	kattar	khainchee
Reconcile, to	parchayan	thahayan.	Road	dhay, wat	pand.	Scorpion	wichhu	bhattun [kar
Red	ratto, garo	lall.	Roof	chhat		Scrap of paper	chattee	kagurjo tuk-
Redness	garan		Room	kotee		Scratch, to	bhajan, khoran	
Refuge	sam [ger to		Root	mur, par		Sea	samundr	
Reel to, cotton	katan,dakan,stag-		Rope	noree	wadr, rasee.	Seal	muhr	
Refuse, to	[illegible]	motayan.	Round	gol		Search, to	golan	khojan
Reins	lugam		Rose	gulab		Season	mund	mahal
Rein. part of do	wag		Rub, to	pihayan	ghontan.	Secret	guj	[an
Relation	sang, maitr		Run, to	drakan, bhajan	doran.	See, to	dissan, niharan	pasan, wajay-
Religion	eeman	dharam.	Rust	kat, mer		Seed	bij	
Remember, to	sambaran	saran.	Rupee	rupayo		Seldom	kadhen, kadhen	kaulo
Repast	nirano		Rump	sathar		Self	pan, jhind	pino
Radish	mooree		Ring dove	geeru		Sell, to	viknan [an	
Report	wahee, awaz		Roc, (a bird)	guran pukhee		Send, to	moklan, ponchay-	rasayan

English.	Dialect of Sar	Dialect of Lar.
Separate	dar	
Seraglio	janano	
Serpent	nagg	sirp, sapp.
Servant	golee	noukar, chakar
Service	belipo	noukaree.
Settlement	chukayan	chukat.
Sew, to	sibban	
Shallow, (water)	tango	
Shadow	pachhaee	
Shake, to	lodan, lodayan	
Shame, to	lajan	
Shameless	nirjo	
Shape	muhandro	
Share	bhango	watt, bahro.
Sharp	tikho	
Shave, to	kuran	
Sheep	gheto, righ	ghatto.
Shepherd	darar	
Sheet	chadar, rawo	
Shew, to	dikharan	
Shield	dhal	sipar.
Ship	beree, dhoondee	
Shoe	juttee, mochro	
Shoemaker	mochee	
Shoot, to	banduk hanan	
Shop	hath	
Shore	kandee	puso.
Short	nandro, nindro	bindro.
Short drawers		kanch
Sigh	ubsaee	
Shot	golee, rejo	
Shoulder	kulho	
Shut, to	payan, bandan	puran, butan.
Sick	nachango	sukhalo.
Sickle	datro	danto.
Side	paso	dis.
Sieve	gechan	paran.
Sight	nigah	
Sign, to	hath akar wijhan	sahee karan.
Silence, to	math karan	
Silent	math	
Silk	pat	
Silver	rupo, chandee	
Sing, to	gavan	
Sister	bhen	addee.
Sit, to	bihan	
Skin	cham, khal	
Sky	ubh	asman, akas.
Slave	bano	
Sleep	nindr	gaharat.
Sleep, to	sumars	
Slowly	hawren	
Slipper	jutee	khallo.
Slipper, to	juteehanan	khallahanan
Small	nandro	mado.
Smear, to (with oil)	makhan	
Smell	was	
Smell, to	sungan	singan.
Smoke	dunh	
Smoke, to	dunh karan	
Smoke in pipe	chilam chikan	
Snatch, to	khasan	
Shirt	jamee, angrakah	
Spider	koreero	
Sneeze, to	chink dewan	
Snore, to	gogra kasran	
Snow	bart	paro rohi.
Snuff	nas	
Snuff box	dunghee, dublee	
Snuff, to	nas watan	
Soap	sabun	
Soft	koowaro	
Soldier	sipahee	
Some	ko	
Somebody	ko maru	
Sometimes	keher mahal	
Something	kin kin	
Son	putr	
Son-in-law	jatro	nathee, niyano.
Song	rag	
Soon	siggo	
Sound	waee, taka	tawar.
Sound, to, v. n.	wajhan	
Sound, to, v. a.	wajhayan	
Sour	khatto	
South	dakhan	
Sparrow	jirkee	
Speak, to	chawan	
Spear	bhalo, naizo	barchee.
Speech	galh	chawanee.
Spend, to	kharchan	
Spinning, to heel	aitr katanjo	nar.
Spit, to	jhukan	
Spite	wer	jid.
Spirit, to	winyayan	
Sow, to	pokhan	bijj wijhan.
Sprinkle, to	chhandan	
Spy glass	durbeen	
Squeeze, to	dadan	
Squall		khabra bharan.
Stairs	charnee	

English.	Dialect of Sar.	Dialect of Lar.
Stand, to	ubhiyan	
Stack, of jawaree	turee	gauno.
Star	taro	
Start	ch,hirk	
Start, to	ch,hirkan	
Stay, to	tikan	
Steal, to	phoran	chhurayan.
Stable	tambelo	kur.
Staff	wado	watan.
Step	perojo rand	wikh.
Stink	kin	gand.
Stink, to	kinno thiyan	
Stirrup	rikab	kanjak.
Stock, (of a gun) stocks	kundak, katt	
Stone	rahan, kod	
Stone of a ring	tik	
Stool	manjee	
Stoop, to		jukan, rukan.
Storm	wach	choh.
Stop, to	bihan, rokan	athan.
Story	akhanee	
Straight	siddo	sawon.
Strangle, to	ghagho diyan	
Strangulation	ghogho	
Straw, (of wheat)	soh, karb, (of jawaree)	
Skein, of thread	foro	
Strike, to	kanan	
String	saggo, dhago	agat.
Strip, to	kapra lahan	
Strong	dado	saggo.
Such	ehro	
Suddenly	ochto	

English.	Dialect of Sar.	Dialect of Lar.
Sugar	khandr	
Summer	unharo	
Sun	sijj	adit.
Sunday	achar, itwar	
Sunshine	us	
Support, to	sambhalan	
Surround, to	weran	
Suspended		adhotar.
Suspicion	guman	bharan.
Swallow, to	gihan	
Swear, to	son khanan	
Sweat	pagghar	
Sweat, to	paggharjan	
Sweeper	chuhro	
Swing	hinduro	
Swing, to	ludan	
Swimmer	taru	
Sweet, (sweet basil)	mitto, (nazbu)	
Sword	tarar	
Small copper coin	kaseero	
Small copper coin	damree	
Saltpetre	kalar	
Stand for hanging a cauldron on	marang	
Spoon of wood	doero, chamcho, [of iron	
Screw	keeree	
Squinting	tredo	
Tail,	punch	punchree.
Tailor	darjee	
Take, to	watan, jhalan	kabu karan.
Take down, to	lahan	
Take care, to	sar lahan	sogo karan.

English.	Dialect of Sar.	Dialect of Lar.
Tall	dhriggo	
Tea	chah	
Teapot	chadan	
Teach, to	sihkaran	
Tear	hanjun	gora.
Tell, to	chawan, akhan	utan, kuchan
Tenant	bharrwaro	
Ten	daho	
Tenth	dahon	
Tent	tambu	khimo.
Then	tadhen	
Thence	hetre	
Therefore	tenhlai	hinakare.
There	ulte, ode	hodan.
Thick	gato, thullo	jado, garho.
Thief	chor	
Thigh, (and leg)	tangh, sithar	tang.
Thing	shaee	tol.
Think, to	janan	bhanyan.
Thirst	unya	
Thirsty	unyayo	
Thither	ede	tedan, tithe.
Thorn	kando, babru	
Thread (spun)	saggo tand	
Threat	tab	dap, dhamkee
Threaten, to	tab diyan	tab wijjan.
Thistle	kanderee	
Threshold	chawat	chaut.
Throat	geechee	
Throne	takht, gaddee	
Through	pat, men	
Throw, to	uchhlayan	
Thrust, to	pehar	
Thunder, to	gajan	guran.

English.	Dialect of Sar.	Dialect of Lar.
Thunder	gor	
Thursday	khamis,	wisfat.
Thus	iyen	
Tie, to	bandhan	
Tiger	sinh	
Tight	soro	kasel.
Till	toree tagan	lagan, sudhee
Time of famine		awasar.
Tire, to	thakayan	wirehayan.
Tired	thako	thakel.
Tired, to be	thakan	
Title	lakab	
Tittle tattle	galhayan	ghusphus.
Tobacco	tamaku	
Toes	perjo angur	
Together	nal. sath	hekando.
To-morrow	subhaee	subhane.
The day after to-morrow	parin	
Tongue	jhibh	
Tools	hathiyar	
Tooth	dand	dandari.
Toothpick	dandan	danderee.
Top	matho	choto.
Touch, to	lagan	chhuhan.
Tortoise	kachhwa	
Tow, to	chilkan, niyun	
Towards	pase, de	
Town	shahr frando	nagar.
Trade	wepar	sodo.
Traveller	wataru	pandheru.
Treasure	khazano	
Tree	wan per	
Tree, root of	thur	

English.	Dialect of Sar.	Dialect of Lar.
Tremble, to	dhudan	dhakan.
Tribe	koum zat	
Tribute	malee	dhal
Trouble	dukh	khapat.
Trowsers	suthan	
True	sachcho	
Trust	wesah	bharoso.
Truth	sach	
Try, to	parkhan	azmayan.
Tune	rag	sur.
Turban	pag, patko	
Turn, to	phiran, ghuman	
Turn, v. a.	phirayan	ghumayan.
Twice	ba pher	
Twist, to	war diyan	
Turnip	gogru	
Torquoise, small	likh	
Thumb	angoot	
Tasteless	phikoo	
Tower	kungaru	
Tickling	katkaee	
Tripe	ojree	
Tailor bird	musru	
Test for metals	kaswatee	
Ugly	buchro	bhundo.
Uncle	mamo, chacho	
Under	heth	
Understand, to	jhanan	samjan.
Until	jistonee	
Up	te, mathe	
Upon	te	
Upright	ubho	
Upside down	lath	ubhto.

English.	Dialect of Sar.	Dialect of Lar.
Urine, to	mutar	
Use	faido, kam	
Useless	nakaro	
Upper garment	peerahan	
Velvet	bakhmal	
Venetian	butkee	seetaramee.
Very	ghano	
Vessel	berie	
Very well	ghano chango	
Victory	fateh	sobh.
Vile	kamino	pajee.
Village	got, wastee	raj.
Villager	got maru	
Vinegar	sirko	
Violence	jor	
Visit	gadjan	
Voice	awaee	sur.
Vomit, to	kadhan	
Vomiting	ok	
Wait, to	bihan, tikan	
Wager, to	hod bandhan	
Waist	chel	
Wake, to	jagan	
Walk, to	halan	
Wall	bhit	
Want, to	guran	
War	jung jero	
Wash, to	dhuwan	
Washerman	khatree	pet, charho.
Watch, (guard)	paharo, jago	
Water	panee, sandaro	
Weary	thakko [water bag	

English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar.	English.	Dialect of Sar.	Dialect of Lar.
Weak	hino		Witness	shahid		Youth	jawanee	lasiyar.
Weather	wa	mund.	Woman	zal	mihree.	Yours	oobasee	
Weave, to	unan		Wood	kathee				
Weaver	koree, uninwaro		Word	galh				
Wedding	wehan		World	dunya, haj				
Week	sat dare	hafto.	Worn	kiyon				
Weep, to	ruan		Worth	mul baha				
Well of water	khuh		Wound	gha	phat, duk.			
Weigh, to	taran		Wrap, to	weran				
West	olo	ulanhado.	Wool	un				
Wet, to	pusayan		Write, to	likhan				
What	chha	kujaro.	Writer	likhanwaro	muharrar.			
Wheat	kanak		Wrong	kurho				
When	kadhen		Widower					
Whence	kithan		Wick of a candle	wat				
Where	kade	kithe	Woollen thread	oonsutr				
Wherefore	kinakane	kujare lai.	Woodcutter	bathari, dayo				
Which	kehro		Whirlwind	wachoro				
Whip	chamkee	korro.	Watermill	aitr pokhinjo				
White	achho		Woof	petoo				
Who?	kehro	kerho	Weak-sighted	chucho				
Why	koh	kujare.	Wrist	karaeeon				
Widow	runera	ran.	Wood, an insect that destroys	sasar				
Wife	zal	Joee, ba.	Weasel	aoreero				
Wind	wa		Wild duck	aree				
Window	daree							
Winter	siyaro		Year	warenh, lal				
Wipe, to	malan	khadkan.	Yellow	zafaran, zaido				
Wise	siyano		Yes	han				
Wisdom	siyanupo	siyanaf.	Yesterday	kal				
Wish	gur		—— day before	tiyodih				
With	san		Young	jawan				
Within	wich, manj							
Without	bahar							

NAMES OF DIFFERENT ARTIFICERS AND THEIR IMPLEMENTS.

English and Sindee.

Carpenter's Tools.

Adze	wahlo.
Auger	sarahee
Adze, 2nd	adee.
Bevel	goona.
Bricklayer's* hammer	tesho.
Compasses	pargar.
Chalk line	rango.
Tile	kanahe.
3-Cornered do.	sohano
Guage	khat kash.
Hand saw	karahee.
Hatchet	kuharo.
Oilstone	rohee.
Plane	rando.
Rabbiting plane	jatee rando.
Plummet	shal.
Mortice chisel	rambho.
Small do.	rambhee.
Large rabbiting plane	darajo.
Smaller do.	maicho
Smallest sort of do.	peshro.
Saw	kart.
Smallest hand saw	jabane.
Trowel, or rather A flat piece of wood for plastering	jehband tunko.
Largest sort of do.	daskhatt.

Potter's Tools.

Cutting string	wijho.
Flattener	tapnee.
Ditto	kanero adare.
Wheel	chak.

Turner's Implements.

Auger	bhirmo.
Bow	kamanjah.
Chisel	rambh.
Do. small	rambhee.
Gouge	nahee.
Pom[illegible]	bharakee.
Rappets	jandree.
Rest	seerahee.

Cotton Spinner's Implements.

Loom	hastree.
Comb of do.	phanee.
Wire of do.	saraee.
Parts of the Loom	manee. adlakkee. rassee. kalee. naree. bhirnee khirkee.

English and Sindee.

Cotton Spinner's Implements.—(continued.)

Brush	seeree.
Reel	bhanyanee.
Roller	taro.
Top of comb	rachh.
Shuttle	naro.
Treddle	chapree.
Part of do.	paisar.
Lever	phirnee.

Goldsmith's Tools.

Anvil	sandan.
Anvil block	adee.
Blowpipe	dawnee.
Brush	waruchee
Crucible	katoree.
Large brush	patranee.
Coal chisel	chhenee.
File	rawatee.
Forceps	chath.
Hammer	matriko.
Small do.	chorasu.
Ladle	rajo.
Mould	top.
Pincers	anbur.
Punch	sumbh.
Shears	kat.
Tongs	saraj.

Shoemaker's Tools

Awl for cloth	khawndee
Awl for leather	ar.
Lap stone	rohee.
Mallet	moongra.
Rubber	kewar.
Plank	takhto.
Frame	[illegible]alib.
Shoemaker's knife	rambee.

Cutler's Tools.

Adze	wahlo.
Gouge	nahee.
Cutler's grindstone	siranee.
Knife	rambhee.
Burnisher	karee.
Hand saw	karahee.
Oil vessel for polishing	tilandee.
Pumice stone	karand.
Wood for do.	kapatee.
Scraper	rando.
Powderer	mooee.

Carder of Cotton.

Pestle	taro.
Roller	panatee.
Bow of carder	dawnee.

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* Carpenters do all the Bricklayer's work in Sinde, or rather the two Trades are united in one person always

English and Sindee.

Carder of Cotton.—(Continued.)

Catgut	nar.
Carder	pinyaree.

Bookbinder.

Lapstone	rohee.
Rubber of wood	mungro.
Compasses	palgar.
Stamp for flowers	sambho.
Iron ruler	khat kash.
Press	shikanjo.
Rubber of stone	mohro.
Knife	kat.
Polisher, (wood) with vermilion die	khewar.
Brass pen for marking	kalam jalwalee.

Blacksmith.

Anvil	sandan.
Sledge hammer	wadan.
Hand do.	matriko.
Tongs	ubhra.
Pointed anvil	mekh sandan.
File	rawatee.
Punch	chhenee.
Large tongs	oobhr waddo.
Auger	sarahee.
Borer which forms the barrel	burko.
Pointed do.	bhrimo.
Wooden rest	charkhee.
Press	sikanjo.
Nut of do.	dedee, and takhto.
Screw	pech.
Wooden anvil	adee.
File	neemgarda.
Punch	sumbh.
Large bellows	khalee dharvaujee
Poker	anguro.
Nose of bellows	beeoo.

Cornice-maker,—Kamangar.

Needle	suo.
Lever	chilmurdo.
Hair brush	mooee kalam.

Bracelet-maker,—Churangari

Lathe	jantr sukhalajo. sand.
Rest	sakhal lohajo.
Bow	kaman.
Chisel	karbana.
Chisel	pat mahtano.
Point	borakee.
Ditto	cheeran
Ditto	singaree.
Grindstone	seran.
Point	naho.
Stock	manjee

English and Sindee.

Coppersmith,—Misgar.*

Hammer	wadan.
Shears	kat.
Tongs	ambooree.
Poker	angooree.
Brasier*	thantaru.

* Same as the above.

Parts of the Spinning Wheel,—Suman antrjo.

Foot	manjee.
Legs	jangh.
Upright	moona.
Winch	makree.
Axle	latan.
Spokes	taree.
Axle tree	guj.
Distaff rest	chamotee.
Distaff	trak.
Thread	dor.
Cotton round the distaff	peer.
Shoulder	gareoo.

Black pepper	mirch.
Colocynth	trunjee gar.
Myrrh	gugur.
Wadf roomee	wadf roomee.
Scammony	mahmoodah.
Ginger	soonth.
Henbane seed	jani khorasanee.
Euphorbium	kheer kowaijo.
Parsley	garfu.
Sweet basil	naug kaisar.
Hyacinth	mur.
Polypody	jalwataree.
Galangal	nagar moonth.
Zedoary,	kafoor kachree.
Thorn apple	dhatoora. charcoo.
Zedoary	jadwar.
Satyrion	salibh.
Marsh mallows	bij khairajo.
Mehilot	agar.
Sweet cane	taj.
Cassia	chatrak.
Fumitory	sindoleon.
Mustard	ahur
Wood	datoro.
	sitawar.
Wild spikenard	trakara.
A cathartic root	treej.
A Boq rush	katoela.
Aniseed	waaf.
Beanpods	doop sangara.
Wood of aloes	agar.
Rue	kinee bootee.
Indian spikenard	kamal patr.
Myrabolan	awrah.
Belleric myrabolan	baherah.
Dried grapes	drakh karee.
Rind of myrabolan	wawgang.

English and Sindee.	
Sesame	kalamchee.
Liquorice, (the juice)	sheeri mitthee kattee.
Capers	karwalee.
Silk	pat.
Orange	sangtaree.
Barberries	zariskh.
Cardamoms, large	wadda phota.
Do. small	nandra phota.
Rosin	pareah.
Melissa	balango.
Ruby	chunee.
Red coral	goonata.
Pearl	mootee.
Seed of ash tree	andayee.
Musk	khastooree.
Water lily	gul koonajee.
Bole ammoniac	songeru.
Testicles of the beaver	khasiya ludra.
Cubebs	kabab cheenee.
Tin	kalaee.
Fumitory	peeta pipar.
Cocoanut	nariyal.
Juice of neem leaves	raswal.
Lawsonia inermis	mendee.
Saffron	bakhru.
Poppy seed	khas khas
Juniper	ahoober
Ashes of bamboo	bhains lochan.
Wild sorrel	chuko.
Tulsee	langajo bij.
Red rose	gul-i-gulab.
Beetlenut	suparee.
Worm seed plant	kando.
Melon seed	gedarejo bij.
Nut-like pistachio	narzah.
Liquorice	mittee kathee.
Cucumber	badrang.
Long pepper	pepree.
Cypress root	lesoorah.
Fruit of tamarisk	sakar.
Oak apple	mawa.
Pomegranate	daru.
Saffron	kaisar
Gum arabic	khor.
Poppy	dodeejee khal.
Coral root	paf marjan.
Amber	kapur.
Dragons' blood	paho surkajee.
	bekh morah
White sandal wood	sirkhand.
Red do.	ratanan.
Oyster shell	sipee.

English and Sindee.	
Pomegranate flowers	gul darujee.
Gum lac	lakh.
Tamarind	gidamree.
Ber	zizyphus jujuba.
Dog's bane	chhimkanee.
Honey	makhee.
Nutmeg	jafar.
Cinnamon	khal dalcheeneejee.
Nightshade	peru.
Leaf of do.	kawal.
Ceruse	safeta.
Stone, shaped like a lentil	damra pahan.
Juniper berries	waund.
Pomegranate leaves	daroo pan.
Asparagus	nang dawan.
Nitre	jau khar.
Senna of Mecca	Sana makajee.
Linseed	bekh kahojee.
Armenian grain	mahlat.
Marjoram	pineer.
Cherry	jamalgoto.
Costus	kath kathia.
Pumpkin	kadu.
Southernwood	boee madeena.
Anise	sooa.
Betony	bakaren.
Burnt brick	guhat.
Mint	phudana.
Yellow myrabolan	harir.
Do. black	harir kara.
Sarcocolla	guna.
Scuttle bone	samundr pheen.
Hemp	bhang.
Rapeseed	sir.
Nettleseed	ootawgan.
Spinage	jefangar.
India thorn	dramaha.
Fenugreek	matheejo bij.
Clove	lawang.
	waru.
Extract of oil	sheer sirjee.
Nosesmart	ahroo.
Hemp seed	bhang.
Bastard saffron	pawara.
Trefoil	bij shambujee.
Wild carrot	gajar khorasanee.
Sorrel	sag.
Wild rue	harmal.
Damascene plumb	alu bhokhara.
White dog rose	bahman acho.
Red do.	bahman garho.
Coriander seed	dana.
Chinese rhubarb	rewand cheenee

Report on Upper Sindh and the Eastern portion of Cutchee, with a Memorandum on the Beloochee and other Tribes of Upper Scinde and Cutchee, and a map of part of the Country referred to. By Lieutenant J. Postans, *Assistant Political Agent. From the Political Secretariat of the Government of India.*

Extent, Soil and General Appearance.

1st. "Upper," known in the language of the country as *Sirra*, or the northern division of Sindh, may be said to extend from Sehwan on the south, to Bukkur and Roree northward, and to include the whole tract of country tributary to the Khyrpoor and Hyderabad chiefs on the plain of the Indus, east and west, between these places (Sehwan and Bukkur). Our political division of Upper Sindh, however, is of a much more limited extent, and includes only the Khyrpoor possessions, and the lands and revenues derivable by the Hyderabad Ameers from Shikarpore and its dependencies. To this division I shall confine my observations.

2nd. Khyrpoor, the capital of the chiefs of that branch of the Talpôr family, is situated to the eastward of the river Indus, about sixteen miles south-east from Roree, (the ancient Hindoo capital of Sindh,) and about ten miles from the river in a direct line. The territory tributary to the Khyrpoor family extends to the north to Subzulkotee; south to Mittanie, (on the river); eastward of the river to Shahgur, belonging to the Dejee chief, Alli Moorad; and westward of the river to Tull, capital of the Beloochee Purgunnah of Boordekur, on the borders of the Brushooree desert, which separates Upper Sindh from Cutchee. The possessions of the Ameers of Hyderabad in Upper Sindh dependent upon the populous and important town of Shikarpoor, extend to about eight miles west of that town to Asseemghurry; east to about six miles, (Khanpore); south to about eight miles (Lukkee); north to Rajhan and Mobarickpûr.

3rd. The soil throughout the whole of the tract of country above mentioned, may be generally described as a rich alluvial, alternating occasionally with loose sand, rich and highly favorable for cultivation; the whole is within the influence of the inundations of the river Indus, which commence to be available for purposes of cultivation in April and May, and cease in September or October. The land when cultivated is unusually productive, but owing to a scanty population, and mismanagement on the part of the rulers a comparatively small portion is brought under tillage, and the inundations are allowed to flow through immense tracts of country, without being rendered available to the purposes of cultivation.

4th. In the Khyrpoor territories eastward of the river, of the various productions of the soil, indigo is the most valuable, and in some parts, of a description superior to that of Bhawulpore and the Punjab. The staple productions of Upper Sindh, however, are sugar-cane, (near the river,) jowaree, wheat, barley, moong, gram, cotton, tobacco, sirshuf, (mustard seed,) rice, badjree, and the other grains common to India. In the vicinity of Shikarpoor, the poppy is extensively cultivated; wheat is the great *rubbee* or spring, and jowaree and rice the *khurreef*, or autumnal crops. Cultivation commences in April and May by means of the inundations, and the crops are reaped in October and November. The wheat, or *rubbee* crops are raised by irrigation from wells, or *bunds*. formed from the inundations. The soil of Upper Sindh, (as indeed throughout the whole of both divisions of that country,) is strongly impregnated with saline matter, and a thick incrustation of salt is every where observable on its surface. Saltpetre is produced in great quantities, and Sindh is noted for its powder. I shall conclude the above brief remarks on the soil and cultivation of Upper Sindh by observing, that this tract of country is favored beyond most others, with extraordinary natural capabilities, and that causes into which it is not necessary to enter here, would appear alone to prevent its being thickly populated, and for its given space, one of the richest and most fertile districts of the East.

5th. The general appearance of the country is an uninterrupted flat, its uniformity in this respect being only broken by a low range of limestone hills through which the river flows at Sukkur and Roree; these extend to some distance towards Khyrpoor on the eastern side; but for a short distance from Sukkur, on the eastern bank where cultivation does not obtain, the soil is covered with a thick low jungle of the tamarisk bush and baubul and camel thorns. In the vicinity of Roree and Shikarpoor, are some rich gardens, and the mangoe, date, acacia, neem, mulberry,* and pepul trees obtain great size and perfection; but expect at these places, a tolerably sized jungle tree is rarely met with to break the monotony of a complete level, and universally low tamarisk jungle. The whole country is intersected with canals and water-courses, and many portions during the height of the inundations are for miles completely under water. This is particularly the case in the neighbourhood of Shikarpoor, and the intermediate tract between it and Sukkur, the river having of late years shewn an inclination to the western, to the detriment of the lands and revenue of the Khyrpoor possessions on the eastern, side.

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* There can be little doubt, but that silk might be advantageously cultivated in this country.

6th. I have before observed, that Upper Sindh is thinly populated, towns and villages are scantily sprinkled over the country. Of the former, the most important in the whole of Sindh, for its wealth, population, and trade, is Shikarpoor, situated at a distance of about twenty-eight miles N. W. from Sukkur; its general appearance is like that of all others in Upper Sindh, filthy and ill built, its walls in total disrepair, and surrounded by large stagnant pools of water; it is redeemed, however, by its gardens. The population of Shikarpoor by a late census may be about 30,000, of whom 20,000 are Hindoos. All the trade and banking transactions for which Shikarpoor is noted all over India and Central Asia, are in the hands of the Hindoos, who enjoy an unusual degree of toleration, and have obtained an influence which the policy of the rulers dictates should not be disturbed. Khyrpoor is a paltry ill-built town, possessing few claims to notice as a place of trade or wealth, and only important as the residence of the chiefs, Meer Roostam and other members of his family. Meer Alli Moorad, his brother, has his stronghold at "*Dejee Kha Kote.*" Roree retains some of the remains of its former wealth, and from its position on an elevation overlooking the river, has an exterior of respectability, little according with its interior state of dilapidation and decay. Sukkur may be said to be a ruined and deserted town, though there can be no doubt, both of these places will daily acquire greater importance, from our influence on the trade of the river Indus, and the countries on its banks. Beyond the above, there are at present no towns which may be classed as of any size or importance in Upper Sindh. In certain divisions of the country under a Beloochee zemeendaree, a small mud fort generally forms the residence of the chief, and capital of the tribe. The villages are a collection of mud huts, with a flat roof; the out-houses are formed of reed mats, and in many villages the dwellings are entirely of the latter, the excessive dryness of the climate rendering them sufficient for the protection of the inhabitants; a small mud *tower* is generally to be seen in the centre of the village, forming a sort of stronghold, and few patches of cultivation are without the same refuge for the husbandman. There is little in the appearance of the towns or villages of Upper Sindh, to impress the observer with a favorable opinion of the condition of its inhabitants, and the whole forms a striking contrast to the air of comfort and security, to be met with in other provinces and countries, far less favoured with natural advantages than Upper Sindh.

No. 2.

Rivers and Lakes.

1st. There are no rivers in the division of Upper Sindh, to which this memorandum is limited; the two great canals which form outlets to the waters of the Indus, are first the "Sindh," which has its mouth a few miles above Sukkur, and passes within a mile of Shikarpoor, proceeding towards Larkhana. This canal is the great means of irrigation to a large extent of country between Shikarpoor and the river, and of immediate value to that town in providing inland navigation for much of its trade during seven months of the year; it has been neglected, however, though a small outlay would increase its value and importance to the revenue; as well as add to the resources of trade and cultivation.

2nd. The "*Bijaree*," nullah, has its mouth in the Beloochee pergunnah of the Khyrpoor territories westward of the Indus, known as "Boordekur," about twenty miles higher up than the Sindh, and waters a great extent of country passing through the above pergunnah, and that of Koopore as far as Kajnan on the edge of the desert. Innumerable smaller canals are led from the two above mentioned, such as the "Noorwah," "Murwah," "Ruswar," &c.

3rd. There are no tanks in Upper Sindh, though it is unnecessary to observe, that they might easily be constructed, and to the great advantage of the country during the dry season, *i. e.* from October to March. The inhabitants of the districts obtain a scanty supply of water from temporary wells dug in the beds of nullahs, a well of masonry and natural springs being seen but rarely, except in the larger towns.

No. 3.

Climate.

In Upper Sindh, there are no periodical rains, and its year would therefore appear to have only two seasons; viz. the hot and cold. The natives of the country, however, divide it into three; viz. *Bahar* (or spring,) *Tabistan* (hot season,) and *Zemistan*, (cold season,) and strictly speaking, it may, from its latitude, be thus divided. The spring is of very short duration; for the cold up to the end of February is often very great, whilst the heat from the commencement to the middle of March, is little exceeded by that of the three following months, and the period of a temperate climate therefore between the extremes of the cold and hot seasons is very brief. The hot season may be said to commence from the middle of March, and continues generally without intermission until the end of August, or middle of September. Storms of thunder with rain occasionally occur in June or July, affording a temporary cessation from the intense heat; but they are by no means to be depended upon. A curious phenomenon is observable in this country on the setting in of one of these storms, it being always preceded for two or three days by a close atmosphere, loaded with a fine description of sand, giving the effect of a thick fog; but immediately previous to the bursting of a storm, the air is literally darkened by immense volumes of sand, driven in black masses before the wind, obscuring the whole surface of the country. These sand storms are the natural effects of the desert tracts surrounding Upper Sindh, over which no violent wind can pass without raising clouds of the shifting sands which cover their surface. With the exception of these passing storms, Upper Sindh is free from the annoyance experienced on this account in the delta during the prevalence of the south-west monsoon. The heat of Upper Sindh from the middle of April to the end of July, is said to exceed that of any part of India, and the range of the thermometer has been known in a verandah to have reached 145°; in a tent it is by no means uncommon to find it at 120°; the hot winds continue to blow severely till midnight, but the mornings are generally cool. The atmosphere is remarkably dry, and generally clear, the ranges of the thermometer during the hot months, do not indicate any great variation. Storms of rain are frequent at the vernal equinox.

During the cold months, *i. e.* from October until the end of February, the climate of Upper Sindh is pleasant and salubrious, frost and ice occasionally occur, and vegetation assumes the appearance of winter in a northern climate. The sun of Upper Sindh is singularly fatal in its effects, not only upon the European, but the native constitution, and during certain periods of the year, exposure to it by the people of the country is as much as possible avoided. There can be no doubt that the climate of Sindh is most trying to the health of Europeans, and a residence of two or three years in it, would undoubtedly tend much to undermine the constitution. During the subsiding of the inundations ague is very prevalent, but in its mildest form. Although Upper Sindh is not exempted from the diseases and epidemics common to the East, it is yet as free from them as most places, and but for its intolerable heat, would be far preferable in point of climate to Lower Sindh, or the Delta of the Indus.

No. 4.

Population.

Our acquaintance with Upper Sindh has been too short, to allow of accurate statistical inquiries, and I cannot therefore venture any remarks on this head. A census which is now in progress of the town of Shikarpoor would seem to shew, that the estimates formed of the population of the principal towns in Scinde, Upper and Lower, have been overrated; thus, Shikarpoor was calculated at 50,000, its real amount being somewhat under 30,000. The population of Upper Sindh may be divided into three classes, Hindoos, Sindhees, and Beloochees. The Hindoos carry on all the trade, not only in the large towns, but are the means of supplying the necessaries of life to the whole of the inhabitants of the country, and few of the smallest villages are unsupplied with a Banyan's shop. The Hindoos of Sindh are necessarily, from their position in a Mahomedan country, a degraded and tolerated class; they are the only people, however, who amass wealth, and to this end are content to suffer any degradation. So useful are the Hindoos in these countries, that their lives and property are generally respected by the most lawless tribes of Beloochees, and they have establishments in the heart of the hills, at "Deerah" and "Khan," the strongholds of the Murrees and Boogties. The Soucars of Shikarpoor are well known for their wealth and banking influence in India, and the countries North-west, where few of the marts are without agents from Shikarpoor, and hoondies are procurable at that place, from Calcutta to Khiva.

The annexed memorandum, which I had formerly prepared on the different tribes inhabiting the tract of country between Sukkur and the Bolan Pass, including as that tract the part of Upper Sindh I have alluded to, will it is hoped, supply any further information required, as to the classification of the inhabitants.

No. 5.

Natural Productions.

1st. *Animals.*—In the jungle and wastes of Upper Sindh, are found the hyena, jackal, hare, partridge, (black, painted, and common grey,) quail, oobarn, (a description of *Otis,* between the floriken and bustard;) and in the tanks and marshes, caused by inundations, wild fowl of every description and in great quantities. The wild hogs commit great destruction in the cultivation, and are a favorite source of amusement to the wealthier Sindhians and Beloochee Chiefs, who hunt and shoot them. The tiger and leopard, are said to be found in the neighbourhood of Sukkur; but it is doubtful if they descend lower than the Bhawulpore territories, where they are said to be numerous. Hawking is a favorite method, amongst the poorer classes, of catching quails and partridges, both of which abound in Upper Sindh.

2nd. In the *Botany* of Upper Sindh, there is nothing of interest; the medicinal herbs, roots, or gums in common use, or for purposes of trade, are supplied from other places.

3rd. *Minerals.* In that spur of the Sullimani range, known as the Murree and Bogtie hills, from the tribes inhabiting them, sulphur and alum are found in some quantities, and form important articles of trade. The settlement of these distracted districts will eventually afford us the desired opportunity, of further enquiry, and doubtless of improvement in the working of the mines. A stone of any description, beyond the limestone procurable at Sukkur and Roree, is not to be seen between the river and the hills* above mentioned, and to a depth of sixty-feet below the surface, nothing but the finest description of sand is observable, the superstrata being the alluvium before alluded to.

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* The Murree hills are for the most part composed of sandstone conglomerates and lime.

No. 6.

Agriculture.

The gardens of Upper Sindh produce the plantain, apple (very small description,) vine, (Caubul,) nectarine (inferior) mulberry, mangoe, (a superior kind,) date, tamarind, jumboo, lime, (sweet and sour,) and pomegranate trees, melons, (from Kandahar seed, &c. of a very fine description,) all the country vegetables common to India; hemp is cultivated for its seed, *bang* being in common use throughout the country, and amongst all classes. The European vegetables thrive remarkably well at certain seasons of the year, and the potatoe might be introduced to great advantage, as it is found to answer admirably.

2d. Implements of agriculture are of the rudest kind, the plough is smaller, and not so heavy as the common Indian plough; the seed is thrown in the soil after the slightest surface has been raised, no manure is required or used, the inundations bringing with them a certain quantity of slimy matter, highly conducive to fertility. The land is allowed to remain fallow from the period of reaping one crop in the autumn to that of sowing the following spring crop, when a few days are sufficient to prepare it for the seed. Agriculture is, in short, of the simplest kind, nature having done too much for man in these countries to induce him to exert himself in improving the soil by artificial means.

3d. The domestic animals are the buffaloe, a small but useful description of white cattle, sheep, and goats. The camel is had in great quantities in these countries, but is of a size and class inferior to those either of Marwar or Central Asia. This animal is in general use in Upper Sindh.

No. 7.

Commerce and Manufactures.

1st. The commerce of Upper Sindh is confined to Shikarpoor, Khyrpoor, and Roree, a general list of the imports and exports of the former, which is the great mart of the country, will, however, prove sufficient. Shikarpoor receives from Karrachee-bunder, Marwar, Mooltan, Bhawulpore, and Loodhiana, European piece goods, raw silks, ivory, cochineal, spices of all kinds, coarse cotton cloths, raw silks, kimkaub and silk manufactures, sugar-candy, cocoanuts, metals, *kirum*, (or groceries,) drugs of sorts, indigo, opium, dyes of sorts, and saffron. From Cutchee, Khussan, and the North-west, raw silk, fruits of sorts, madder, turquoises, antimony, medicinal herbs, sulphur, alum, saffron, assafœtida, medicinal gums, cochineal and horses. The exports from Shikarpoor are confined to the transmission of goods to Khorassan, through the Pass of the Bolan, hence Shikarpoor is one of the gates of Khorassan; and a trifling trade with Cutchee, they consist of the following: indigo (the most important,) henna, metals of kinds, country cloths, European piece goods (chintzes, &c.) Mooltan coarse cloths, silks manufactured, groceries and spices, raw cotton, coarse sugar, opium, hemp seed, shields, tobacco, embroidered horse cloths, and dry grains. Through the excessive jealousy of the *Ahilkars* at Shikarpore, in revenue matters, it is difficult to ascertain the value of the trade of the place; but some estimate may be formed from the revenue thence derivable, and the amount of this last year was ascertained to have been about 55,000 rupees from commerce, (see list of duties by the author published in the Bombay Government Gazette, under date the 28th July). The manufactures of Upper Sindh are confined to the preparation of coarse cotton cloths, particularly in the Khyrpore territories, and at Roree to the weaving a coarse description of silk fabric, known as "*duryan*," from the raw silk imported from the North-west. In artizans of every description, this country is totally deficient, and even the preparation of leather, for which Lower Sindh is somewhat celebrated, is quite unknown in Upper Sindh.

No. 8.

The Khyrpore possessions in Upper Sindh consist of 14 Talookahs
Talookahs and Villages. and 556 Villages, thus:—

No. of Villages.	*Names of Talookahs.*
137	1. Derbela.
43	2. Kundearee.
51	3. Ghagivree.
31	4. Khyrpore.

No. of Villages.	*Names of Talookahs.*
89	5. Height Tuppahs.
15	6. Der.
15	7. Bhoong Baud.
5	8. Sabzul.
23	9. Boordekur.
15	10. Chakmazarchee.
13	11. Roopal.
66	12. Scattered.
48	13. Laddah Gajan.
5	14. Shuldadpore.
556 Villages.	

The amount of revenue divided between the 16 members of the Khyrpore family is about 20 lacs annually.

The Talookahs and Villages appertaining to the Shikarpoor Pergunnah, from which revenue is derivable by the Ameers of Hyderabad, are as follows:—

No. of Villages.	*Names of Talookahs.*
5	1. Mahal Kahee.
7	2. —— —— Lukee.
5	3. Mobarickpore.
6	4. One-third of Roopur.
23 Villages.	

The amount of revenue derived from the above is 1,18,500 rupees, divided between Meers Noor Mahomed Khan and Meer Hussen Khan, (the former 75,000 and the latter 43,200.)

Shikarpoor, 1*st August*, 1840.

Memorandum on the Beloochee and other Tribes of Upper Sindh and Cutchee.

1. Few tracts of country of equal extent present so great a diversity of tribes as that lying between the Indus at Bukkur, and the great Pass of the Bolan, and as the new position which we at present occupy in Affghanistan, has rendered this portion of country an open line

of communication, and consequently brought us in connection with its inhabitants. The following list of the various tribes, with their subdivisions may be considered interesting. A map accompanies this memorandum, which explains the portion of country occupied by each tribe, whether Sindee or Beloochee. In the memorandum, the towns, villages, cultivated or waste lands, &c., are not given, as the subject may form one for a more statistical and detailed report hereafter.

No. 1.

Khosahs.

A numerous tribe of cultivating Beloochees, inhabiting the whole of the intervening country between Sukkur and the Sindh canal, towards Shikarpoor, and from thence, to the westward of Rajhan, along the edge of the desert. The Khosahs are not a predatory tribe, but employ themselves generally as cultivators. The portion of their country between Sukkur and Shikarpoor, is rich and productive, owing to its facilities for irrigation. The Khosahs during the Kalarah dynasty, had considerable possessions to the eastward of the river Indus, beyond Khyrpore. This tribe has four sub-divisions,—

1. Kulloolanee, (the chief is of this tribe.)
2. Bukiume.
3. Toneeanee.
4. Sooreeanee, (near Rojahan.)

Tributary to the Khyrpore government, and the chief holds jaggeers under a sort of feudal tenure.

No. 2.

Juthooee Beloochees.

The Juthooee are a small tribe, inhabiting the tract of country immediately to the east of Shikarpore, extending to the Indus in that direction, to the confines of Boordekur and the Sindh canal, on the north and south. The Juthooees were predatory, but the Khyrpore government, to whom they are tributary, has considerably restrained them, and they now bear a good character as quiet cultivators. The encroachments which the neighbouring tribe of Beloochees are constantly making on the Juthooee lands, has occasioned a feud between the two tribes, shewing itself in repeated acts of violence, which are stopped by the chiefs, when they become mutually detrimental, under a compact of peace, for a certain period. The Juthooees have the following subdivisions:—

1. Brahmanee,
2. Beijarranee,
3. Budanee,
4. Shadingur,
5. Julleelee
6. Sahawanee,
7. Sungujur,
8. Rodranee,
9. Sheran,
10. Khosan,
11. Seyed Khananee.

The principal town is Durapur, situated to the east of Shikarpoor about twenty miles. The Juthooee country is necessarily productive, in consequence of its facilities for irrigation.

No. 3.

The Boordie tribe of Beloochees.

The Boordies form a numerous and powerful tribe of Beloochees, inhabiting the country to the north-east of Shikarpoor. The bounds of Boordekur extend to the south to the Indus; north to the Soolyman range and the Boogtie country; east to Gooblah, and the Budanee, and Kulkee tribes of Jutt; and to the west to midway between Tull and Meerpore. There are four principal Sirdars, or heads of tribes in Boordekur.

Boordekur is rich and productive, being advantageously situated for irrigation from the river. Jowaree is the principal cultivation, wheat, however, is in some parts plentiful. The Boordies are essentially a predatory tribe; their whole country is tributary to Meer Rustam of Khyrpoor, and pays in kind according to seasons. The Boordies are sub-divided into fourteen tribes, as follows, three of them have again their sub-divisions:—

1. Boonglanee, ..
   1. Shuragye.
   2. Kunderanee.
   3. Dyreeanee.
   4. Sahulkanee.
   5. Sahutranee.
2. Ghaghanee, ..
3. Kuneesanee,
4. Nidwanee,
5. Bajkanee,
6. Buhulkanee,
7. Dahanee,
8. Japie,
9. Bukeranee,
10. Chohilanee,

11. Tighanee,
12. Soondranee, ..
    1. Loolwee.
    2. Arbaee.
    3. Jageranee
13. Sooranee, ...
    1. Subzye.
    2. Golao.
    3. Bungwah.
14. Bujranee, .. 4. Ruhazye.

Principal Town, Trull.

No. 4.

Jummallee tribe of Beloochees.

The Jummallees, a poor, and not numerous tribe of Beloochees, cultivate and feed flocks at Rajhan, and other places along the southern edge of the Bunthooree desert; they have also villages in Cutchee.

The Jummallees are robbers; and have been associated with the Jekranees. The tribe is subdivided as follows. Their chief, Lusker Khan, of Rajhan :—

1. Rundanee,
2. Moondranee.
3. Dusktee,
4. Shirkananee, (the chief is of this tribe.)

No. 5.

Tribe of Khyberries.

The Khyberries affect to be Sheikhs originally from Affghanistan; their sacred character, however, did not protect them from the lawless Doomkie and Jekranie tribes, who drove them from their lands and villages, on the other side of the desert, and obliged them to seek for refuge at Khanpore, about eight miles westward of Shikarpoor. The Khyberries muster about 800 men, and are a peaceable tribe; they have no subdivisions.

No. 6.

The Oomranee tribe of Beloochees.

A Beloochee tribe, cultivators and feeders of flocks at Manewtie, and in the direction of Kunda, not numerous or powerful, having been much oppressed by the predatory tribes. The Oomranees have eleven subdivisions.

1. Tungeeanee,
2. Barrachanee,
3. Ghumeeanee,
4. Ferozanee,
5. Belanee,
6. Mulghanee,
7. Pulledanee,
8. Jungheekhanzye,
9. Sazuzye,
10. Rindanee,
11. Muzaranee.

No. 7.

Tribe of Jutts.

This is a Scindee tribe, scattered over a large tract of country, and occupied entirely as cultivators, and rearers of cattle. Some of the Jutts, the *Beyahs* for instance, are wealthy and powerful as zemindars, but the tribe is for the most part composed of a poor and wandering class, who occupy moveable habitations, and lead an unsettled life, shifting their positions as forage and water may render necessary. The Jutts are peaceable themselves but exposed to the constant violence of the predatory tribes in Upper Sindh; under a vigorous and protecting Government, they would become useful subjects; at present, immense tracts of country formerly cultivated by them, are lying waste. Subdivisions of the Jutts,—

1. Beyah, (the most powerful,)
2. Sudayeh,
3. Buthpond,
4. Deyah,
5. Kuhahpootrah,
6. Bookujaut,
7. Surkee,
8. Durodgurt,
9. Oomur,
10. Joonejhur,
11. Marafanee,
12. Lodruh,
13. Kooharah,
14. Wuggun,
15. Tihern,
16. Gomu.
17. Purvur,
18. Sutarh,
19. Mehir,
20. Bungah, (Cutchu,)
21. Budanee,
22. Kalkee.

There are other subdivisions, but the above are those located in Upper Sindh.

No. 8.

Tribe of Boogtie Beloochees.

A numerous, and essentially predatory tribe, inhabiting the hills to the northward of the Bershoree desert. Their capital and stronghold is Deerah, sixty miles eastward from Phoolajee There are fifteen subdivisions of this tribe.

and they are said to muster about 3,000 men, principally foot. The chief, Beburruck; eldest son, Ahmed Khan; second son, Islam Khan.

Subdivisions.

1. Rarjah, (Chief.)
2. Kulpur,
3. Mussoorie.
4. Noakanee,
5. Moondranee,
6. Keyazye,
7. Shumbranee,
8. Seydanee,
9. Notanee Ferozanee.
10. Notanee Durruk,
11. Soondeeanee,
12. Rumazye,
13. Soorkurree,
14. Phong,
15. Chundrazye.

No. 9.

Tribe of Jekranee Beloochees.

Though not numerous, the Jekranees were the most active and formidable of the marauding tribes, and were for many years the terror of the whole line of country lying between the Indus and the great defile of the Bolan. Their former capital was Chuttur. With the advantage of having an asylum in the Boogtie hills, they shared plunder with that tribe, in consideration of the shelter afforded them. Chiefs, Durya Othun and Turk Allie; all mounted men.

Nine Subdivisions.

1. Subwanee, (Chief.)
2. Majanee,
3. Seeapaz,
4. Soofamanee,
5. Nodkanee,
6. Soolkanee,
7. Moolkanee,
8. Kurrookanee,
9. Durkanee.

No. 10.

Doomkie Beloochees.

Mustering about as many men as the Jekranees, with whom they were linked as plunderers. The Doomkie chief, Bejai Khan, was the acknowledged leader of both tribes, and had his stronghold at Phoolajee, commanding the great Pass to Deerah and the Boogtie hills. Bejar Khan has one son, Wuzzeer Khan.

Thirteen Subdivisions.

1. Meerozye, (Chief.)
2. Muhamedanee,
3. Brahimanee,
4. Baghdar,
5. Shabkhar,
6. Deenaree,
7. Gongee,
8. Kurkkorie,
9. Talanee,
10. Loondh,
11. Seenghanee,
12. Guzyanee,
13. Wuzeranee.

No. 11.

Murree Beloochees.

This tribe of Beloochees is considered to be the most numerous and powerful of any below the Bolan Pass. They inhabit the northern portion of the range of hills bordering Cutchee to the West and North, called after the two tribes, "the Murree and Boogtie hills," though a spur of the Sullimani range. The Murrees are essentially predatory and warlike; their depredations extending to Bagh, Gundava, and the whole of Cutchee, with the Bolan Pass, and Hummund and Dajel in the Seikh territories. The Murree chief, Dodah Khan, has his stronghold at Kahan, a respectably sized fort, situated in a well watered plain, of about six miles in its greatest extent, and exceedingly productive; particularly in wheat Kahan is distant about sixty miles in a North-westerly direction, from Phoolajee, passing through defiles, and therefore much exposed to annoyance from an enemy. Kahan is the only fortified place which the Murrees possess in the hills; but there are other strong positions well supplied with forage and water, to which they betake themselves when driven from the fort. The Murree country is well supplied with running streams, and its villages are exceedingly productive. The climate, in consequence of its elevation, is much milder than that of the plains, the thermometer averaging for the month of June 1840, the maximum 97°, and at 8 P. M. 85°;* rain is of frequent occurrence; roads pass through the Murree country to Hummund, Dajel, Rozan, Dera Ghazee Khan, and Mooltan, and are traversed by merchants, bringing goods from thence to Cutchee, Gundava, Bagh, and other places, in that direction, on which black mail was of course levied. The Murrees, like other hill tribes, though nominally tributary to the Khanate of Kelat, have ever affected independence, and tribute was rarely, if ever, exacted.

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* At Lehree and Phoolajee in the plains, the thermometer during the same month stood at 120° in a tent.

The Murrees have subdivisions as follows:—

1. Guznanee, (the Chief is of this sub-division,)
2. Beejaranee, (Dukel Khan,)
3. Lallwanee, (Lall Khan,)
4. Seealkosh,
5. Bundeeganee,
6. Madenee,
7. Ballaree,
8. Roonganee,
9. Soomranee,
10. Koomgaranee
11. Pommoadee,
12. Soolwanee,
13. Shajoo,
14. Soheranee,
15. Sheranee,
16. Moomdanee.

The Murrees may amount to between 2 and 3,000 fighting men, of whom 3 or 400 only are mounted; the country they inhabit being unfavourable to Cavalry.

General Observations.

1. The preceding are the tribes inhabiting the line of country between Sukkur and Lehree in Northern Cutchee, as also the hills to the north and west of the latter. Beyond Lehree, there are also the following Affghan and Pattan tribes skirting the hills, and in the low country, between Lehre and Dadur: the Khujucks, a large tribe, are at Sibbee, to t westward of the latter place.

1. Shadozye, (Affghans.)
2. Sheeroone. ,,
3. Buzdar, ,,
4. Kutrians, (Chief, Meer Hujee.)
5. Dunums, } Pattans.
6. Loonee. }

From Brushoree, northward and westward to the Bolan and Gundava Passes, are the tribes of *Rinds, Abnahs,* and *Mughsus;* only the former of these are Beloochees. The two latter are Jutts. The *Rind* Beloochees claim precedence over all the Beloochee tribes, and are said to have formerly possessed the greater portion of the country on this side of the Brushoree Desert, now subdivided amongst the various tribes enumerated; they are now, however, but few in number, and have their locality at Shorun near Bagh, under the Chiefs Sirdah Khan, and his son Shah Allie.

2. Of the preceding tribes, the Khosahs, Juthooes, Jumallees, and Boordies, are subjects of the Sindh Government; but the tribes inhabiting the country northward of the Brushoree Desert, were until the late establishment of H. M. Shah Shoojah's authority, tributary to the Khan of Khelat.

The Doomkies and Jekranees, formerly the most lawless and predatory of the tribes inhabiting the plains, are now peaceably settled as cultivators, many of them being enlisted for police duties in Northern Cutchee, whilst the lands which they usurped from the Kyberrie tribe, have been returned to their lawful owners, and others assigned for the subsistence of the two tribes alluded to.

3. The cultivating classes of Beloochees and Sindhees, such as the Khosahs and Jutts, were constantly exposed to harassing forays, and thus the former, finding no security for life or property, left the tracts of country which they formerly cultivated in Northern Cutchee, and confined themselves to this side of the Desert. A better system of things, has, however, induced many of the Khosahs to return to Lehree, and the neighbourhood of Shapore.

4. The Beloochees, as seen in Upper Sindh and Northern Cutchee, are a large muscular race, particularly the hill tribes of Murrees and Boogties. Their features are large, and decidedly Jewish, while the custom of allowing the hair to grow to a considerable length, depending over the shoulders and falling wildly on the forehead, (a very uncommon habit among Mohammedans,) imparts to the Beloochee's countenance, a remarkably ferocious expression.

5. The Beloochees, who may be considered as foreigners in Sindh, possess an unwritten dialect peculiar to themselves, apparently mixed up considerably with both Pushtoo and Persian.

6. The character given by the neighbouring people to the Beloochees, is proverbially bad,* and there is every reason to believe it to be not unmerited. The predatory habits of the Beloochee, seem not to have been forced upon him by circumstances of necessity,

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* The term Beloochee, or as it is spelt in the language of the country *Baloche*, is thus analyzed:—

B.	*bud,*	bad.
C	*lubee,*	covetous, (Sindee.)
W		wild, unsettled.
Ch.	*chor,*	a robber.

since the country he inhabits, possesses capabilities of no ordinary kind, but rather from a natural propensity to lawless practices.

The Beloochees are vindictive, treacherous, and cruel. In their feuds, they hold no terms but blood for blood, and while committing their depredations, spare neither age nor sex.

7. As may be expected from a totally ignorant people, uninformed on all but the merely external observances of the Mahomedan religion, the Beloochees are to the highest degree superstitious. The office of a Syud is so much respected by them, that he forms the only security for the faith of tribes towards each other, and is himself the only individual whose life is safe in the hands of a Beloochee.

8. Unrestrained in these countries, as the Beloochee tribes have been, in consequence of the lax nature of the Governments, they are not now disposed to yield willing submission to new systems of controul, calculated to check the long established freedom of their lawless habits, and compel them to the acknowledgement of a regulated authority.

9. The Beloochee tribe of Northern Cutchee, have ever been more dependent upon plunder than cultivation, which seems in accordance with their habits of idleness and dissipation. With the produce of the country at his disposal, it was scarcely probable, that the wild and lawless Beloochee would settle as a quiet agriculturist, consequently the small portion of these tribes who come under the denomination of "cultivating classes," are usually found to be the dependents or slaves* of influential chiefs.

10. In Boordekur, and other portions of the country to the southward of the Burshoree desert, the Beloochees being of a less decidedly predatory class, cultivate more extensively than those above mentioned.

The restraint which good government will impose on these tribes, with the aid of patient encouragement to peaceful occupation, must in time effect a reform in their habits and practices. The general character of the country they inhabit, as one possessing capabilities of great fertility,† is in every way favorable to the object in view, and there can be little doubt eventually, but that these semi-barbarous tribes will afford a proof of the radical change, which a just but energetic system of rule may effect in a country, and the condition of its inhabitants.

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* Slavery obtains amongst the Belooche tribes, children being bought and sold or exchanged, for goods in kind.

† The effects of the inundations of the Indus extend to the vicinity of Rajhan; all the intermediate country being as capable of fertility as any part of the rest, and

SHAWL.

The district of Shawl is situated between 29° 50′, 30° 50′, and 66° 4′, 67° 20′.

Extent and General Appearance.

This district is bounded on the North by the Tukatoo mountains; East by those of Zurgoon and Jhurkoo; West by Chuhul-tun; South by the Bolan range. The general aspect of this country is hilly, rocky and sterile, particularly the southern aspects; but where mould exists, which is the case on many of the northern faces, vegetation is luxuriant. Many of the hills are composed of mica and talk; coal of an inferior description is found in the Bolan Pass.

Soil.

The soil in the valleys is rich and of a light brown colour, and although water never reaches many of them, save that which falls from the heavens, the southernwood and many other sweet-smelling herbs grow luxuriantly, and in spring flowers of various descriptions carpet the vallies. The soil generally is well adapted to all descriptions of horticulture and agriculture, particularly all kinds of English vegetables. The greater portion of the valleys lay waste in consequence of no water being procurable for irrigation, but here and there small patches are to be seen, which entirely depend on rain for coming to maturity. In these valleys, the artesian wells might

when cultivated, wonderfully productive. To the north of the Burshoree desert, the river *Narie* to the st, and abundance of water found at a short distance from the surface in the East n part of Cutchee, offer every facility for irrigation and cultivation. The jawarree is principally cultivated in the plains, and wheat on the hilly country, the crops are unusually rich.

Note.—One tribe h been omitted in the foregoing pap viz. hat of Mughe having their locality to the South of Wagh, at Jullah Khan; Chief, Ghullam Nubbee.

Sub-divisions.

1. Hajeezye.	Belochees
2. Bumbeeranee.	
3 Bhund.	
4 Arbanee.	

be adopted with success. That which is termed the valley of Shawl, is at an elevation of about 5,500 feet above the level of the sea, and has advantages over most of the surrounding country, being in most parts abundantly supplied with water from small mountain streams; and that part which is under cultivation, produces very rich and beautiful crops.

Rivers.

There are no large rivers, but one or two considerable streams, the chief of which is the Sosa, into which most of the inferior streams empty themselves.

Climate.

The year may be considered to be divided into four seasons: spring, which commences in March and lasts till May, during which time the thermometer ranges 70°, lowest 50°; summer, from June to August, range of thermometer, highest 80°, lowest 76°; autumn from September to November, range of thermometer, highest 60°, lowest 40°; winter, from December to February, range of thermometer, highest 50°, lowest 30°. The prevailing winds are westerly and southerly, and always cool; a good deal of snow falls in the valley in January and February.

Population.

The population of Shawl may be estimated at about 4,000 men, a third of whom are Kasees, (or cultivators of the soil,) 2,000 may be reckoned as Afghan Kakurs, and the remainder as mixed tribes, including the Hindoos of the town of Quetta.

Wild Animals.

The hills of this district abound with wild sheep, goats, and hogs.

Plants.

A great variety of English plants are found, and a variety of English trees, shrubs, and herbs are to be found, such as cherry, almond, hawthorn, barberry, &c. &c. Also the juniper, which grows to the height of from eighteen to thirty feet. Within eight miles of Quetta, there is a forest of this description on a piece of table land, affording an inexhaustible source of fire wood, as also rafters for building. The wood of this tree is exactly similar to that used in cedar pencils, and the scent equally aromatic. The assafœtida grows in abundance in these hills. The orchards in the vicinity of the town and villages are very beautiful, composed of apricots, mulberry, greengages, plum, pear, apple, pomegranate, &c. interspersed with a variety of other trees, such as the poplar, willow, may, &c. The fruits though good, are not equal to those of Candahar and Cabool.

Minerals. Iron is found in some parts of the district.

Agriculture. The chief agricultural produce is wheat, barley, mukah, (or Indian corn,) rice, peas, lucerne, mujeed, (or madder,) carrots, baugluns, spinnage, cucumbers, pumpkins and melons.

Implements of Agriculture. Common small Indian plough, spade, and hoe. No wheeled carriages.

Manure. Dung of cattle, burnt stubble, and black earth from the town.

Domestic Animals. Good sized bullocks for carriage and draught, camels, and sheep in abundance.

Commerce and Manufactures. It produces madder, wool, carpets, blankets, and numdars or felts; madder and wool are the only two articles exported, and those inconsiderable, in consequence of the great consumption in the country, their habitations being chiefly also of blanket; thin grain-bags and tapes are made from the wool, the staple of which is eight inches, but coarse. The whole of the inhabitants are clothed in numdah cloaks, &c. The revenue of Shawl at present, does not exceed 24,000 Rupees per annum.

Various Routes in Scinde from official documents from Bombay, of March 1840, *communicated by the Government of India.*

Route from Sehwan to Kurrachee direct, Quarter Master General's Office, Camp Kurrachee, 12th February, 1840.

Sehwan to Roree, eleven miles and half a furlong. From the gardens south of the town, near the river, two small choppered villages, with some cultivation and three wells; a nullah was found with a good supply of water, about one mile on the S. W. of the village. A small stream runs through Aree Peer, about a mile and a quarter to the westward, and a good supply of water always to be found one mile further, in the same direction, in the bed of the river; the road is very good over a level plain.

Tarrae a middling village, is passed at four and a quarter miles, and Cuchee, Bajar, and Jangur, three large villages, from two to three miles distant, on the right bank, about nine miles from Sehwan. Forage was got by the grass-cutters, above Aree Peer, also kurby to purchase.

Forage was scarce, but furnished by the grass-cutters from the banks of the river.

Warkee river, near its junction with Chorla river.—The Warkee river is small, and joins the Chorla river about half mile on the right, near which there is a pool of water, at the foot of a rock, which terminates Loond hill, and which lasts all the year. Warkee camp appears to be the usual halting place, and had more grass about it than where the dragoons encamped; there are two roads which separate at the place where the Dheeng river is crossed about four miles from Roree, one running on each side of Loond hill and meeting again one mile in front of Warkee; the road running to the right of Loond hill, along the Chorla river, is longer, but reported better. The halting place by it is called Chorla Mukam, near some ancient tombs, where there were also fine pools of water in the river. The other road is more stony, as it crosses the Dheeng river two or three times. Camp at the Mulleeree river, ten miles. Some good pools of water stated to last all the year. Forage scarce, but procurable by grasscutters about the river and on the hills on the right; the ranges of hills on each side approach much closer, and at four miles the road enters the defile of the Joorung river, and continues along its bed and banks for about three miles very rough and heavy, and some rocky nullahs afterwards are crossed before reaching the camp, on Pokrun river, twelve miles and three and a half furlongs. Extensive pieces of deep water, and a small stream running. There is no village seen since leaving Roree, though some of the shepherds of the country brought in some goats here; there is a good deal of thinly scattered jungle amongst which the shepherds' huts are located. The road continues to ascend slightly until the fifth mile, crossing four or five rocky nullahs running into Mulleeree river; it is then better with a slight descent, and crosses some nullahs running southward into the Pokrun river. Forage more plentiful, but procured in the same manner by the grass-cutters, about the river banks.

Kajoor camp on the Kajoor river, nine miles and four and a half furlongs.—Good pools of water. This is the same river with the Pokrun, but the forage not so plentiful; the road is pretty good in general, crossing the river at the sixth mile; at the eighth mile it is confined between the hills and the river for a short distance, where it is rocky, and crosses the river again, to camp; roads run off here, and about midway to Moehun Kote, a fort of the Ameers, beyond the hills on the left.

Doobah camp on the Doobah river, eight miles and two furlongs.—Good pools of water on the same river, here called the Doobah. Forage as above. The road is pretty good all the way, through thin jungle, crossing ten or eleven nullahs, some of which are considerable.

Murraie Mukam on the Murraie river, nine miles and three and a half furlongs.—Water in the sandy bed of a broad river. Ahmed Khan's Tana, a large village with good supply, is about two miles S. W. further up the river; it is the residence of the soobadar of the district; two other small villages lie between it and the road called Mahomed Khan and Jansir, but neither have any supplies. There are two roads here, one running on each side of a low range of hills; that to the left is the usual route, and the halting place at Meerkhan Tanna, a village with two or three shops, and is also on the bank of the Murraie river with water from pits in its sandy bed. The guides brought the detachment by the other road, as having more water; and on account of its being nearer the large village of Ahmed Khan, the road pretty good.

Dumajee, nine miles and six and a half furlongs.—A small village of about twenty choppered huts, and a few Banian supplies; water from two wells, and a pool of rain water in the bed of the river, all of which were exhausted and found insufficient for the detachment, and part of the camels were not watered. Forage more plentiful, but some distance on the plain to the front and rear of the stage by the road; the road pretty good.

Trak Mukam at Trak river, nine miles and three and a half furlongs.—The Trak river is crossed at nine and a quarter miles, and water is found in its bed at all seasons, about two miles on the left at the base of the hills, through which it passes to the Southward. The distance is not increased by going to this point, though so far off the beaten camel road, and paths go direct to, and from it, before reaching the river. Forage abundant, and the road good through jungle, and some cultivation at the fourth mile.

Bhoot Camp, two miles and seven and a half furlongs.—A place at the Huttul-ke-Bhool hills, where a nullah contains a good supply of water from the late rains, with plenty of forage; country covered with thin

The roads to Jerakh and Hyderabad cross here.

jungle and grass, but Trak should be the halting place, making Kuttajee the next stage.

Kuttajee Mukam at Kuttajee river, twelve miles and three furlongs.—The river about six furlongs on right, has good pools of water, which never fail, especially at the base of the hills here, where it passes through the range to the S. W. Forage as above; the road is in general good, excepting where it crosses some nullahs, and is a little confined between the river and some low hills on left at the eighth and ninth miles, where it is stony, then good, through jungle bushes to Kuttajee.

Goorban Camp at Goorban River, six miles and four furlongs. The confluence of the Gorban and Kuttajee rivers, both having small running streams and large pieces of standing water; forage not so plentiful, the road at two miles from Kuttajee has a slight but stony ascent, at the top of which the Gohar tullao occurs, at present filled with rain water. At three and a half miles, a rocky ghaut or defile commences, and continues an easy descent passable for guns; but, being most of it bare rock, is rough; it crosses two stony nullahs, at the bottom; at four miles some more rising ground is passed from the nullah, when the road is good again along the Kuttajee river to camp, crossing the river at the junction.

This long march was made from an expectation that from [illegible] t having gone off the road to Trak, a di[illegible] of from th[illegible] four miles had been saved, which was not the cas[illegible] as it proved

Dumba Camp, ten miles and two furlongs,—is on the Dumba river, which had good pools and a small stream of water running. Forage is procurable by the grass-cutters in considerable quantities about Dumba, but more plentifully a few miles before reaching it; the road is in general good, and passes Peepulwaree river and Mukam at six and a quarter miles, which has water in some small wells at present dug in its bed, and a good deal of short grass and thin jungle.

Camp Kurrachee to the lines of the Grenadier Regiment by the high road, seventeen miles and one and a half furlong —This road is that generally travelled, and is longer than that by Dozan about one mile, but stated to be much better; the first thirteen miles being over an extensive level plain, in most parts thin jungle, but, a good well beaten track; at nine and a half miles Reekee Koree and two huts are passed, on the left, but the well is small. A ree nullah, at present containing pools of water from the late rain, is passed at ten miles; at thirteen miles the road runs through some rocky ridges and uneven hard ground, passing a pool of salt water at thirteen and a half miles on the left, and is then good to camp. Kurrachee town two miles. Total 146 miles and one furlong.

(Signed) N. CAMPBELL, *Major,*
Acting Quarter Master General of the Army.

Reconnaissance of the Route from Tatta to Kurrachee. January, 1839.

The distances stated were those given by the perambulator. The sketches as far as Gorafi were taken in the direction of that place, laid down in the protracted route of Lieut. Maxfield, but were afterwards filled in from the distances by perambulator, and by a few bearings taken in the general directions, and to remarkable objects on the right or left of the road. No detailed survey was attempted, and these are merely intended to give an idea of the character and direction of each day's march.

From the Hill above the Camp to Googah.

One mile.—A dry nulla with deep sides, which would require to be cut down. The road to this descends the hill by a very easy slope covered with milk bush. The road is stony, and winds a good deal among the bushes. Several baubul trees grow about the nulla or canal, and it is bordered by a few bushes. The country, after crossing the canal, opens out into a plain, over which the road is very good.

Two miles and two furlongs.—Enter a tamarisk jungle; a very indifferent field of wheat on the right; a flock of sheep seen grazing.

Two miles and six furlongs.—Cross a dry canal. A well of good water with a wheel worked by bullocks, the water is not very plentiful, but it produces a little cultivation; steps are made to descend into the well, and considerable care appears to have been bestowed upon it. Some bundles of jowaree seen near the road. The country with low jungle, but presenting no obstructions.

Four miles and two furlongs.—Bed of a river, or canal, covered with coarse grass.

Five miles and six furlongs.—Road up to this over an open plain, but now passes for a short distance through a low jungle, but not thick; low rocky hills immediately on the left.

Six miles and six furlongs.—Enter a low jungle, the road a little cut up, a village about one and a half mile to the right. Country, a plain covered with low jungle.

Seven miles and four furlongs.—Road a good deal cut up here, and through a low tamarisk jungle; soil sandy, but generally hard.

Seven miles and seven furlongs.—Pass a small canal, about four feet deep, and the road then runs along a kind of bund. The country is covered on both sides to a considerable distance with coarse grass. Herds of cattle and several tattoos seen grazing.

Eight miles and one furlong.—Leave the bund and cross a small canal. The road along the bund is by no means good. Country here has the appearance of having been divided into fields, and also of being marshy in wet weather.

Eight miles and two furlongs—Pass the bed of a river, the banks to the right very steep, bed hard at present; pools of water.

Eight miles and four furlongs.—Village of Googah.

Eight miles and seven furlongs.—A bund across the river.

The village of Googah is of rather respectable appearance, and may contain about 200 houses. The water is obtained from pools in the bed of the river, which are at present about two and a half feet deep. The river at the bund is forty paces wide. Above the bund, there is also a pool, and wells have been dug, but the supply by this means appears by no means plentiful. The water is drawn in several places by wheels, from wells communicating with the river. A field of sugar cane was observed on the banks of the river, and there are some clumps of fine baubul trees. The ground about the village is covered in most places with a low jungle, especially between it and the river. The site of the village is very slightly raised. An oil-mill was seen at work, and between twenty and thirty camels counted in the vicinity. No supplies of grain were procurable, and the coarse grass is the only forage.

From Googah to Garah, commencing at the Bund.

One furlong.—Cross the bed of a canal, about fifteen paces wide, with very steep banks, and the earth heaped up on the sides, making it from ten to fifteen feet deep. There is also a small ditch, and the whole would require a good deal of work to render the road passable for guns.

Five furlongs.—Road good over a level country, partially covered with grass and jungle, low hills about a mile to the left.

Seven furlongs.—A small canal, country to the right covered with coarse grass, upon which herds of cattle were grazing. On the left, a tamarisk jungle, but by no means thick.

One mile and one furlong.—Jungle for a short distance, and road somewhat cut up, but soon becomes hard and good over a level plain, on which low bushes are scattered. Herds of camels, principally females, with young ones, seen grazing.

Three miles.—A canal dry, with a little grass on its banks.

Five miles.—A dry ditch. Road continues hard and good.

Five miles and one furlong.—A dry ditch, road enters a jungle, which requires clearing.

Five miles and four furlongs.—Descend into the dry sandy bed of a river, along which the road runs for about two and half furlongs. A branch joins from the left, in which there is a pool of bad water. The bed of the river is about twenty paces broad. Banks not very steep, but a good deal broken and covered with jungle. On leaving the bed of the river, the road runs for a mile over wreaths of fine loose sand, into which horses sink very much, and which would be almost, not quite, impassable for guns. A few bushes are scattered upon the surface.

Seven miles and seven furlongs.—Road enters a jungle, and is pretty good.

Eight miles.—A small dry canal, road hard and good. Country continues a plain, covered with low jungles.

Eight miles and one furlong.—Descend into the bed of a river, the banks are covered with jungle, which does not however extend far.

Eight miles and five furlongs.—A dry canal, road a little broken, but in general hard and good.

Ten miles and five furlongs.—Dry rocky bed of a torrent flowing from some low hills, on the right. The Garrah creek close on the left, water salt.

Eleven miles and three furlongs.—Road descends into the bed of the creek, and runs along the edge about three furlongs; it then passes through a rocky opening, and approaches the village of Garrah. The country appears quite a desert, sand hills crowned with low jungle, and no appearance of cultivation. During the whole march no travellers of any kind were seen, and the guide apparently left the road of the mission, and took a short cut across the country. Two wells mentioned in Captain Maxfield's route were not seen.

Twelve miles and eleven furlongs.—Garrah contains about 300 houses and fifteen or twenty banyan's shops; gram, bajeree and wheat are procurable, and also forage brought from Mulleer. The water is supplied from wells within some enclosures, about three furlongs to the right of the village, but is by no means good, five were counted. They are about six feet deep, from two to five feet in diameter, and have about one and a quarter feet of water, consequently could only be sufficient for a very small body of men; no other water could be found in the vicinity. The creek is navigated by small boats; it is nearly dry at low water, but it is said to be ten or fifteen feet deep at high water spring tides. Large boats are now prohibited sailing from Garrah. Kurrachee may be reached by water in two days. The gram and wheat sold in Garrah is said to be brought from Sehwan, it is in itself utterly destitute of all supplies, being situated in a desert.

From Garrah to Peepree River.

One mile.—Dry bed of a river, road hard and good, but winding among hillocks of sand covered with low bushes, some low hills on the right near the road.

Two miles and four furlongs.—Road up to this very good, but is here a little broken; country, sand hills covered with low bushes.

Two miles and seven furlongs.—A slight rise in the country, which is covered with milk bushes, road good.

Three miles and four furlongs.—Bumbhora on the left, about quarter of a mile distant. Bumbhora is a low hill covered with milk bushes, and can hardly be distinguished in coming from Garrah, from the ground on that side being itself a little raised above the plain. Its appearance is somewhat of this description; road good, but a little stony; water is said to be procurable at Bumbhora.

Three miles, and five furlongs.—Milk bush ends here.

Four miles and one furlong.—Pass some low hills and a little tamerisk jungle, open sandy plain on the left, road excellent; two ruins on the plain to the left.

Five miles and four furlongs.—Road over a firm sandy desert, jungle on the right, dry bed of a river in which water is said to be procurable by digging.

Five miles and five furlongs.—Pools of salt water on the right, road along the edge of undulating ground covered with milk bush.

Six miles.—Road passes over some undulating ground scattered with milk bush and tamarisk, but is hard and good; saltwater pools to the right.

Six miles and four furlongs.—Low undulating hills upon right of road, and a long narrow patch of swampy looking ground on the left covered with long grass; road good, low jungle on the left.

Nine miles and four furlongs.—Wattanjee Landhee.—The road up to this runs along what has the appearance of having been a sea beach; the country to the left being an open plain as far as the eye can reach, covered in some places by low jungle, and on the right, low hills which sink down abruptly to the plain; the road is in general excellent, except where it is sandy and heavy, across what resembles the mouths of rivers; of these there are four or five, from 100 to 250 yards across. Wattanjee Landhee is situated in an opening of this kind. The caravanserai is in good repair, and there is a well of good water, ten feet deep and nine in diameter, with two feet of water. It is drawn by a wheel, and there is a small garden. On leaving Landhee, the road crosses some heavy sandy ground, but is afterwards very good.

Twelve miles and one furlong.—Garrah creek on left of the road about eighty yards across, with apparently deep water, is very winding in its course. The road up to this runs across two bays, the hills receding a little, about a quarter of a mile, in the centre of each, in the last they became regular sand cliffs. The road is excellent in the first, but a little cut up in the second. The low hill, Bhader or Shasher, is on the left, and composes part of a low range. Road now leaves the low ground, and ascends a gentle slope, but is hard and good.

Twelve miles and three furlongs.—Cross a dry nulla, road sandy but good, over an undulating country covered with milk bush, and quite a desert.

Thirteen miles and five furlongs.—Cross a dry nulla with broken banks, country as before.

Fourteen miles and two furlongs.—Sandy bed of a river, ground undulating, road pretty good.

Fourteen miles, and five furlongs.—Peepree river and ruined caravanserai. The river is from thirty to fifty yards wide, banks broken, rocky bed filled with sand, three wells of pretty good water, largest eleven feet deep, four in diameter, with thirteen inches of water. The soil is a stiff sand. The other wells are smaller, one is quite dry; six cattle and four buffaloes seen watering here. Country a complete desert, with scattered milk bushes. No travellers of any kind seen this march, but the road is well defined throughout; a flock of goats seen near Wattangee Landhee.

From Peepree River to Shurabee, a village in the Mulleer district.

Four furlongs.—Road very much cut up; on the right bank of the Peepree river deep and sandy, country desert, and scattered with milk bush.

Seven furlongs.—Small open plain to the right, country to the left undulating, and covered with milk bush, road hard and good.

Two miles and three furlongs.—Sandy bed of a river about fifty yards wide, left bank much broken by ravines and precipitous, descent very bad, ascent on right bank easy: road up to this good, country desert, scattered with milk bush and low thorns.

Three miles.—Sandy bed of a river, about forty yards wide. Banks precipitous, from ten to fifteen feet high, descent on left bank very bad. A ravine runs on the right bank, for about a furlong on the immediate right of the road. Country desert, undulating, scattered with milk bush, road hard and generally good.

Five miles and seven furlongs.—Sandy bed of a river about thirty yards wide, banks precipitous and broken; road good and hard.

Six miles and two furlongs.—Dry sandy nulla, four yards wide, banks perpendicular, about four feet high.

Six miles and seven furlongs.—Tombs of the Jams on the right, about two miles distant.

Seven miles and one furlong.—Road diverges to the right from that to Hadjee Oomer-ka-Landee, and lose sight of the long extent of flat country, which is seen on the left over the undulating ground bounding the horizon since leaving the Peepree river. Country desert, undulating, and scattered with milk bush.

Seven miles and seven furlongs —Descend into a vast plain, bounded by lofty mountains in the distance. Country open near, but a good deal of jungle in the distance.

Eight miles.—Hadjhee Oomur-ka-Landhee about a mile to the left.

Eight miles and four furlongs.—A small red tomb to the right.

Eight miles and seven furlongs.—Country a good deal broken, but road hard ; milk bush scattered about the Mulleer river. About 150 yards to the right, abundance of good water in pools, bed in other places covered with grass, banks sloping, covered generally with high and thick tamarisk jungle.

Nine miles and four furlongs—River turns to the right, road pretty good, but in places sandy, and cut up. Country an undulating sandy plain, with low bushes scattered about upon it.

Ten miles and one furlong.—Well of good water on the right, about eight feet deep, and supply pretty good ; some little cultivation, open plain to right with jungle in the distance. Country broken, undulating, and covered with milk bush to the left.

Twelve miles and four furlongs.—A small village, with an indifferent well on the right. A little grain procurable, but no forage.

Thirteen miles and seven furlongs.—Village of Shurabee about half a mile to the right of the road, with a small well. Country level, covered with low bushes and some baubul trees, a scanty herbage of coarse grass, affording pasturage for flocks of pretty good sheep. Camels also seen grazing in the vicinity. The village itself is merely a few miserable huts, but there are some attempts at enclosures about it. Grain is procurable in small quantities, and also a little forage. A few travellers were met during this day's march.

From Shurabee to Kurrachee.

One mile and one furlong.—Jungle pretty thick, road sandy, and cut up into deep ruts; coarse grass among the jungle.

Two miles and four furlongs.—Bed of Mulleer river, water procurable by digging to the depth of a few feet, bed 250 yards wide, deep and sandy, banks sloping, descent on left bank very deep, and heavy. Road runs through a thick belt of jungle on the right bank.

Three miles and four furlongs.—Bed of a river, hard and sandy, banks sloping covered with jungle, and a good deal cut up.

Four miles.—Bed of a river with low banks, jungle opens

Four miles and five furlongs.—Bed of a river about 300 yards wide, of deep sand, banks easy, and sloping. Country becomes more open and undulating ; road hard and good.

Five miles and five furlongs.—A precipitous bank on the immediate right of the road, for about a mile; road hard and good.

Seven miles and one furlong.—Road enters upon Kurrachee plain, after passing over a range of rising ground, with steep hills ; but of no very great elevation. Road hard and good; some tombs upon the left. Kurrachee, Mumora fort, and the rocky islands at the mouth of the harbour come into sight at this point.

Nine miles and one furlong.—Fuqueer's tank near the town of Kurrachee, road over a level plain, hard and good. No cultivation seen during this march, and no travellers. Kurrachee is a large town, stated to contain about 14,000 inhabitants, (Lieut. Carless' report,) and is surrounded by a mud wall, with towers, which is, however, now in ruins. A few old guns are still visible. The suburbs are extensive, water by no means very abundant. The Fuqueer's tank is nearly dry, and the water used by the inhabitants is procured from wells dug in the bed of the Lyaree river. These are in general about four or five feet deep, and appear to be temporary, but one was observed built up in the middle of the river, and there are others near the banks, for the use of the gardens, which appear to be pretty well kept up ; no cattle were seen near the town, and it is said that few or no horses are kept; grain is pretty abundant, brought from Upper Sinde ; but at present very dear. Forage is extremely scarce, and dear. The general communication appears to be by camels direct to Hydrabad. Mumora fort, commanding the mouth of the harbour, is about five miles distant, in a straight line, and a long detour is necessary to reach it by land. The usual garrison of Kurrachee is stated to be from 100 to 200 men. The whole of this part of the country is now suffering from two years' want of rain, which has converted it into little better than a desert. In general, the country about Kurrachee and in the Mulleer district abounds in water and fine grass. Mumora fort is supplied with water from the town.

Kurrachee to Ghor-ka-Landhee.

Two miles and two furlongs.—Begins to ascend a gentle slope to the ridge of elevated ground, tombs on the immediate right.

Two miles and four furlongs.—A steep rocky hill on right.

Two miles and seven furlongs.—A steep rocky hill on left, road pretty good, but stony.

Three miles and three furlongs.—Some deep heavy sand, road then becomes pretty good, country level, scattered with bushes.

Three miles and five furlongs.—Pass what appears to be the bed of a river, banks very low.

Four miles and one furlong.—River about 150 yards wide. Pools of salt water, a foot deep, banks easy and sloping, bed hard, road before laid among low hillocks.

Four miles and three furlongs.—Road still bad, among low hillocks, bed of a river about 150 yards wide.

Four miles and five furlongs.—Bed of a river about 120 yards broad, of deep heavy sand, left bank broken, and precipitous, road still bad.

Five miles and one furlong.—Mulleer river two furlongs broad, bed deep and sandy, banks easy, scattered with jungle.

Six miles and four furlongs.—Pass through some jungle, road heavy and bad, among small hillocks.

Eight miles.—Road becomes good.

Nine miles and four furlongs.—Ghor-ka-Landhee, country during this march a plain, after leaving the ridge of elevated ground quite barren, and scattered with a little jungle. There is a small well of very indifferent water near the Landhee. The country here is covered with low bushes, and a little coarse grass is seen, but no appearance of cultivation.

Ghor-ka-Landhee to the Peepree River.

Two miles and six furlongs.—Open plain on both sides, of considerable extent.

Five miles, and four furlongs.—Hadjee Oomur-ka-Landhee. A well about sixty feet deep, cut through sandstone, with a sloping descent, and steps into it, eight feet in diameter, and one foot and a half of green looking water.

Seven miles.—Enter the other road. The road is in general good, but in some few places, sandy and heavy. The country is level, scattered with milk bush, quite desert, and no appearance of cultivation.

Thirteen miles and five furlongs.—Peepree river, and ruins of Landhee.

General Report.

The general direction of Karrachee from Tatta, is about W. ½ N., and the distance fifty-eight and half miles, nearly, by the perambulator, from the top of the hill above camp to the Fuqueer's tank, at the former place. The road itself presents no obstructions which could not be easily removed, except being in several places deep and heavy from sand.

The country, with the exception of that about Googah, and in the vicinity of the Mulleer river, is at present little better than a perfect desert; at these places there is the appearance of a little cultivation.

The scarcity of water is so great at present, that this route is impassable for troops, except in small detachments of from 100 to 200 men. There is a good supply at the Mulleer river, and at Googah, 35½ miles distant from each other; but at the Peepree river and Garah, it is both very scarce and bad. Kurrachee itself is by no means particularly well supplied, and additional wells would be required, were any force to be stationed there.

Grain is procurable, but in no great quantity, at Garah, and of course at Kurrachee; but it would be unsafe to depend upon that place, even for any in considerable supply.

Dry forage is procurable in small quantity at Garah and Kurrachee; but not equal to the consumption of even a small body of cavalry; what may be procured from villages near the road is altogether insignificant. About the Mulleer river and at Googah, a considerable quantity of coarse grass might be procured by grass-cutters.

Fuel appears to be abundant.

Several flocks of sheep and goats were seen near the road; camels are abundant.

To render the route practicable at present, it would be necessary to dig wells at the Peepree river and Garah, and even then it is impossible to say what supply can be procured till the experiment is tried on a pretty extensive scale; water is certainly procurable by digging in the beds of the rivers, but it is necessary to go to the depth of from five to ten feet. The Mulleer river near Kurrachee is the only point where water was seen within two feet of the surface.

Landhee also appears a favourable place for wells, but does not give marches of such convenient length, as the Peepree River and Garah. Should a supply be abundant at these places, the marches would be

		Miles.	*Furlongs.*
Kurrachee to	Mulleer River, ...	14	1
,,	Peepree ditto, ...	8	7
,,	Garah ditto, ...	14	5
,,	Googah ditto, ...	12	0
,,	Camp ditto, ...	8	7
Total,	.. .. ..	58	4

In considering the communication between Tatta and Kurrachee, the Garah creek should certainly not be overlooked, as although very winding, it affords carriage by water to within twenty miles of camp. Boats of from twenty to thirty candies are said to be able to go as far as Garah, and the water at Bumbhora to be sufficiently deep for vessels of much greater burden. At this last place, are the remains of wells filled up, and it is not impossible that it might be found to be an eligible situation for depôts of provisions, &c. should this route become of importance. The investigation of this point, however, can be satisfactorily carried on by means of boats only.

The whole of this part of the country is said to be at present suffering from a want of rain for two years. Without being acquainted with the actual change produced by a favourable season, it is impossible to say exactly, in what degree the communication would be facilitated with regard to supplies, or impeded by the rivers, canals, or standing pools; many of the former, from the state of their banks, appear to be, for a longer or shorter period, the channels of rapid torrents; and the country in several places has the appearance of being under water, or very swampy, during some time of the year.

In addition to the unfavourable circumstances with regard to the want of rain under which this route is at present seen, may be added the evident want of exertion on the part of the inhabitants to put the supplies which the country does afford, at the disposal of any part of the British Army.

(Signed) A. C. PEAT, *Captain,*
Bombay Engineers.

Report on the Road from Sinde, from Subzul to Shikarpoor. By Mr. NOCK.

1. Surwaee, the last stage in Bhawal Khan's country, is a small village, in which is the tomb of Nawab Moosa Khan, direction N. E. 80°, distance eight miles from Subzul-kote, and the road leads through slight jungle, a nulla about half way with a wooden bridge, and a village, the frontier of Sinde.

2. Subzul-kote is a pretty large place, having a good bazar, and many wells, out of the town, of good water; to the North, is the dund or lake, which is fast drying up; the spot chosen for the encamping place, is among some ground broken by the plough, S. E. of the town, in the neighbourhood of wells, and a small jungle, which can soon be cleared.

3. Oobowrah is about thirteen miles distant from Subzul, due W.; the encamping ground lies N. E. and S. E., the same spot where the Shah encamped on his way to Shikarpoor. There are three good wells about the vicinity, known by a date tree near the lake, and one of them undergoing repairs; on the other side, in a grove of large tamarisk trees, another well, and in a plantation, marked by a few plum trees, (Ber,) one well independent of the wells in the village, and the nulla

over which the pucka bridge is built, which is going to decay, contains water all the year round, and teems with fish. The road to be traversed is inundated ground when the overflow of the river Indus takes place; at present dry, and considered a good road, with the exception of a slight jungle. Oobowrah, distance from Subzul, is about thirteen miles.

4. From Oobowrah, next stage is Bagoodra. The road on the first onset, is over bogs of mud and water, and over a nulla with a wooden bridge; the jungle runs from here about a mile distant, after which a good road until about half mile near the village of Mammadpoor; before reaching this, you pass a lake and the villages of Rajunpoor and Sooee to the left, distance about three-quarters of a mile from the road, and Tig one mile, also a garden and well. Leaving Mammadpoor you meet the small village of Koraeen and the Muswaee drain running on to Meerpoor, and on reaching Bagoodra a nulla is crossed; distance from Oobowrah thirteen miles. The encamping ground is on the South of the village, having the command of five good wells of water: here the Shah once encamped.

5. Surhad is about nine miles distance from Bagoodra, and after leaving a jungle runs for about, then a good space for about one mile until Tutta Malna, after which a slight jungle until reaching the drain, when a pretty thick one commences to near the village. A well and a few habitations of shepherds, with the village of Janpoor, is seen to the right. A good encamping ground, with more than nine wells in the neighbourhood. Shah Shooja encamped here.

6. Gotkee from Surhad is about nine miles, a pretty good road almost all the way; about the midway, is a canal thirty feet broad, but no great obstacle, and perfectly dry; there are also two small drains to be passed before reaching Gotkee.

7. From Gotkee to the next stage is Dadoola, distance about thirteen miles, direction S. W. 70°, passing three villages, Bammoowala, Bhisttee and Malloodee; all the way a slight jungle, which can soon be cleared with a little trouble. The encamping ground is on the North side of the village, having the use of three wells on the lands. This part of the country is well peopled, and cultivation is getting on prosperously; passing Bhelar is a drain, which should be avoided. By trending on the East side, the road is much freer from jungle, direction

S. W. 64°; this village is situated on the dund, and deep water, which runs on to Azeezpoor and Hoosein Belee. The encamping ground had better be on the bank of the dund, which is about ten, twelve, and fourteen feet high; the road leads on the bank, and over jungle, and in one place over a cotton field on to Azeezpoor, which is also near the river, but the ferry commonly known by the name of Azeezpoor-ka-Pattan, is at the village of Hoosein Belee. Azeezpoor from Chooga is about four miles distant.

9. The next halting place is Hoosein Belee, at the ferry. After crossing a deserted dund, completely dry at the road, and some small jungle, there are two streams at the present ferry; one, the dund, about 150 feet broad, with two, three and four feet water, the last is an extensive one; two boats ply here, one on each stream, and people land on the Bet, or island, having to go about one and a half mile, when they again embark and land on the other side. The two ferries made here are a matter of choice of the boatmen to save themselves the trouble of plying to a long distance; for there is a good ferry higher up where the army should cross.

10. The Indus on the western bank contains water twelve, sixteen, and eighteen feet, and at the centre stream more than thirty and forty feet deep, with a strong running current. Near the Bet (an island,) ten, twelve and eight feet water, and on the East bank four, six and eight feet water. There are two villages situated on the northern bank of the river, named Syud Ameer Mohamed and Phoolooda Ghat, crossing the ferry. The place of encampment pitched on is at the village of Ghat Awril, about a mile from the river, and in a fine plain; the river water is used here, and there is but one small temporary well.

11. From Ghat Awril, taking a direction N. W. 80°, about a mile on the road, is the small village of Mota Mar, and then about half a mile further is a good drain, over which is a temporary bridge, all sheltered; horsemen are obliged to keep to the left, and pass the drain, taking the same direction; and leaving Rubban and Eajmut to the left, the latter a comfortable village, you pass a small jungle on to Koriee, where is the encamping ground of the army on the south of the village; the difficulty here to be experienced is from the well water, which is not good.

12. Leaving Kaee, the direction varies to N. W. 60°, distance from Ghat Awril to this place is little more than twelve miles. Shikarpoor is the next stage, before coming to which you pass through a good path, road on both sides free from jungle, and after reaching Lubauna, you pass the Sinde canal. Lubauna is a village under Meer Aly Moorad, and to appearance the inhabitants are in a comfortable way; patches of cultivation mark the road on to Shikarpoor. Distance from Kaee nearly twelve miles.

(Signed) J. NOCK.

(True Copy,)

(Signed) ALEX. BURNS,

Envoy to Kelat.

Proceedings of the Asiatic Society.

(*Friday Evening*, 13th *January*, 1843.)

The Annual Meeting of the Society was held on Friday evening the 13th January, the Hon'ble the President in the Chair.

The following Gentlemen were proposed as Members of the Society :—

The Rev. CHARLES IRVINE, St. Xavier's College. Proposed by the Hon'ble Sir H. SETON, seconded by H. TORRENS, Esq.

Lieut. BAIRD SMITH, Bengal Engineers. Proposed by H. TORRENS, Esq, seconded by Lieut. A. BROOME, B. A.

Baboo COSSINATH BHOSE. Proposed by Dewan RÁM COMUL SEN, seconded by Baboo PROSSONO COMAR TAGORE.

JOSEPH ST. POURCAIN, Esq. Chandernagore. Proposed by Dr. WISE, seconded by the Acting Secretary.

Library.

The following list of Books, presented and purchased, was read :—

Books received for the Library of the Asiatic Society, for the Meeting of the 13*th January*, 1843.

The Calcutta Literary Gleaner, for January 1843. Vol. I, Nos. 9 and 11, from the Editor.

The Calcutta Christian Observer, for January 1843. New Series, Vol. IV, No. 37, from the Editor.

Oriental Christian Spectator, 2d Series. Bombay, November 1842. Vol. III, No. 11, from the Editor.

Journal des Savants, Juillet 1842. Paris.

Annals and Magazine of Natural History. London, September 1842. No. 62. Purchased.

London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science, 3d Series. Vol. 21, No. 136, August, 1842.

Transactions of the Society of Arts, &c. London, 1841. Vol. LIII, Part 2d.

Proceedings of the Geological Society of London, 1840-41. Vol. III, Part II, Nos. 72 to 76.

Yarrell's History of British Birds. London, 1842, Part 31. Purchased.

Chinese secret Tried Society of the Tien-ti-Hi-uh, by Lieut. Newbold and Major General Wilson. Presented.

Stevenson's Translation of the Sanhita of the Samadeva. London, 1842.

Iben Khallikan's Biographical Dictionary, translated from the Arabic, by Bn. Mac-Gluckin de Slane. Paris, 1842. Vol. 1. from the Author.

Archæologia, or Miscellaneous Tracts relating to Antiquities. London, 1842. Vol. XXIX. from the Archæological Society.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for the month of November 1842, from Government.

Read the following letters from Government.

No. 1184.

To H. TORRENS, Esq.

Secretary to the Asiatic Society.

General Department.

SIR,—In continuation of the previous correspondence respecting the proposed publication of Dr. Cantor's Chusan Report in the Researches of the Asiatic Society, I am directed by the Hon'ble the Deputy Governor of Bengal, to transmit to you for the purpose therein mentioned, copy of a further letter from Dr. Cantor, dated the 10th of October last, together with the Manuscript which accompanied it, entitled, "Some account of the Botanical Collections made by Dr. Cantor during his service in China," drawn up by Assistant Surgeon W. Griffith.

I have the honor to be, Sir,

Your most obedient Servant.

H. V. BAYLEY,

Deputy Secretary to the Government of Bengal.

Fort William, the 14*th December*, 1842.

To G. A. BUSHBY, Esq.

Secretary to the Government of Bengal.

SIR,—I have the honor to submit the accompanying Manuscript, entitled, "Some account of the Botanical Collection made by Dr. Cantor, during his service in China," drawn up by Mr. W. Griffith, who on receiving a series of duplicates of the botanical collections formed for Government during my service in China, promised to undertake the task now performed.

2. As the contents of Mr. Griffith's Manuscript are illustrative of the Descriptive Catalogue of Animals, collected at Chusan, which I had the honor to draw up by order of the Right Hon'ble the late Governor General, it would be desirable that both should be published in conjunction.

3. As you have been pleased to present my Manuscript to the Asiatic Society, I have the honor to solicit that you will favor me by presenting Mr. Griffith's Manuscript to the Asiatic Society, with a view, that it may appear in the same volume of the Society's Researches, in which my Manuscript is to be printed.

4. Mr. Griffith has offered to correct the press when he shall have arrived in Calcutta.

5. Finally, I beg to apologize for the unavoidable delay which has taken place in the transmission of the accompanying Manuscript.

I have the honor to be, &c.

(Signed) T. CANTOR,

P. W. Island, the 10th October, 1842. *Assistant Presy. Surgeon.*

(True Copy.) H. V. BAYLEY,

Deputy Secretary to the Government of Bengal.

Ordered—That the thanks of the Society be returned to Government, and that the MSS. be published in the Transactions.

No. 317 *of* 1842.

From G. A. BUSHBY, ESQ. *Officiating Secretary to the Government of India, to* H. TORRENS, ESQ, *Secretary to the Asiatic Society. Fort William, the 7th December,* 1842.

Political Department.

SIR,—I am directed by His Honor the President in Council to forward to you for submission to the Asiatic Society, the accompanying Fac Simile of an Ancient Inscription recently discovered in Aden, by work people employed in excavating a new road, together with transcript of a letter from the Political Agent at Aden to the Secretary to the Bombay Government, forwarding the same, with his observations.

I have the honor to be, Sir,

Your most obedient Servant,

Fort William, the 7th December, 1842. G. A. BUSHBY,

Officiating Secretary to the Government of India.

Ordered—That the letters be duly acknowledged, and that Captain HAYNES' letter with a lithograph of the Inscription be referred to the Secretary for early publication in the Journal.

Read extracts from private letters of Major TROYER to Mr. TORRENS and to Baboo RAM COMUL SEN, enquiring as to the transcription of the Vedas for the French Government. The Hon'ble the President stated that this had been a private account between the late Mr. JAS. PRINSEP and the French Government, and that on the retirement of M. GUIZOT from office, the allowance of 1500 francs annually had been stopped; that the accounts had been duly rendered; and that there was even a small balance due. Upon enquiry of KAMALAKANTA PUNDIT, who had conducted the Benares correspondence, he stated, that about "seven anas" 7-16ths were copied and sent, and that the remainder 9-16ths could be obtained whenever cash arrangements were duly made.* The Acting Secretary was requested to communicate officially with Major TROYER, on the subject of his letter, after making due enquiries.

Read the following letter from T. S. STOPFORD, ESQ. accompanying the handsome Donation to which it refers, and for which the best thanks of the Society were voted, for his polite attention in supplying this blank in the Museum.

Chandpore, Diamond Harbour Road, 2nd January, 1843.

MY DEAR SIR,—Mr. Higginson tells me, that the Asiatic Society is in want of a good specimen of a *Wild Boar.*

By the bearers I send one I killed yesterday, than which I have seldom seen a finer. He was a famous one too, having been hunted last year several times by the "Tent Club," without success, and became the terror of the villages about this place.

If it could be stuffed, it would be better than a *skeleton*, and ticket it, "Presented to the Asiatic Society's Museum in behalf of the "Tent Club," and killed by J. S. Stopford, 2nd January, 1843." I remain, Dear Sir,

Yours truly,

J. S. STOPFORD.

The following list of articles presented to the Society by Lieut. W. S. SHERWILL, 66th Regt. N. I. Revenue Survey, Gya, was read. They will be found referred to more particularly in the Zoological Curator's report.

List of Specimens presented to the Asiatic Society's Museum. By LIEUTENANT WALTER S. SHERWILL.

One Horn of South African black Rhinoceros. R. Africanus.

One ditto, polished.

One pair of Horns of Male Hartebeest. Damalis Canna.

One pair of Horns of Male Bontibok. Gazella Pygarga.

One Skull of Ethiopian Hog, Sus Larvatus, from Port Natal, South Africa.

One lower Jaw of Hippopotamus.

One pair of Horns of Rocc Rhiebok, Redunca Villosa.

Two Tusks from lower Jaw of Hippopotamus, (S. Africanus.)

One strip of Hide from Hippopotamus, of which are manufactured the Cape "Samboks," or Whips.

Two Tusks of Hippopotamus, (lower jaw.)

Two lower projecting circular Tusks or Rooters of the same animal and individual; killed at Port Natal.

One Skull of Hyrax, or Rock Rabbit, from the summit of the Spitzkopf Mountain, the highest peak in S. Africa, height 10,250 feet above the sea, which is seen to the south at the distance of 126 miles.

Two Wooden Spoons of Hoolu manufactory. Tribe of King Moselekatse.

One Horn of Springbok, Gazella Euchore,

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* Major Troyer's letters also stated, that the Societé Asiatique had not yet received the 4th Vol. of the Mahabarata though dispatched long ago.

Two odd Horns of Blesbok, Damalis Canna.

One single Horn of a Cow Eland or Impoofoo, Damalis Oreas. Bull stands six feet six inches high at the shoulder.

Six Poisoned Arrows of Bushman manufacture, made of reeds, tipped with bone from the Ostrich thigh bone, inserted in a piece of strong wood, and bound with the dorsal sinew of the Springbok Antelope. The poison is composed of a species of red slime or moss, called by the Dutch "klip gift," or "rock poison." It is common to all waterfalls and damp spots in the snowy mountains in South Africa; this ingredient mixed with the poison from the poison-fangs of the Cobra-de-Capello and the inspissated juice of a bulb named by the Dutch "telp," resembling a crocus with a blue flower, forms a mass which is smeared on the shaft and bound with sinew. The effects of this poison are sudden and very fatal.

Three Tails of Cameleopards, C. Australis.

6th November, 1842.

The grateful thanks of the Society were ordered for this handsome Donation, of which many of the objects excited great admiration, and are most valuable additions to the Museum.

Read the following extract of a letter from Lieut. Baird Smith, referring to his former enquiry as noticed in the Proceedings of (See November or December Proceedings.)

Camp Delhi, 11th December, 1842.

My dear Sir,—Accept my best thanks for the trouble you have taken in forwarding to me the extract from the Papers, relative to the Earthquake of the 11th ultimo, and those in Persian &c. relative to Earthquakes in general. Both are most acceptable, and you will oblige me by thanking Mr. Torrens in my name for the latter.

There is no doubt whatever as to the existence of the Zill Zillee Namah, and that portion of the Calcutta native *savans* who doubt of this, because not themselves aware of it, have fallen into the not unusual error of reducing the information of others to the standard of their own ignorance. Dr. Falconer has repeatedly seen and examined it during his travels in Cashmeer, and by a note just received I learn, that although a copy of it cannot be procured in Delhi, many of the learned natives there are acquainted with the work. I fear, however, that it is from Cashmeer only that it is to be procured, and I have sought the aid of Mr. George Clerk in procuring it thence.

Very sincerely yours,

R. Baird Smith.

Read the following letter from the Curator in the Zoological Department:—

Asiatic Society's Museum, 13th December, 1842.

Sir,—I beg to represent to you the urgent necessity that exists for not longer delaying to supply cases for our rapidly increasing collection of stuffed Mammalia.

Of the many specimens that are now risking the consequences of exposure, I find that two have already suffered from insect ravages. Fortunately, these chance not to be of value (further than as regards the time expended on the preparation of them), being merely a Jackal and a common Fox; but the same injury might have happened to species which are not so easily replaced, and which are still liable to be thus attacked and ruined.

It is moreover injurious to such of our specimens as are under cover, to crowd them one upon another, as I have hitherto been obliged to do, to bring as many of them as possible within the protection of the two small glazed cases which alone can now be allotted to them; and the proper display of our collection of Mammalia to visitors is altogether impracticable under existing circumstances.

I may also be permitted to add, that it is evidently felt as discouraging by our taxidermists, that the specimens upon which they have bestowed so much pains in getting up, should be suffered to receive injury for want of the needful protection of glazed cases.

It is now some months since the admeasurements were taken for two large cases, such as would amply supply our present wants, to be placed outside the Society's meeting-room, and opposite each branch of the staircase; but I have understood that the order for these has been, for the present, countermanded; and in the mean while it devolves on me to remind you that the perishable specimens intended to fill them are in constant jeopardy, certain of them having already suffered injury as hereinbefore mentioned.

Yours obediently,

Ed. Blyth.

Ordered—That the estimate be prepared, and referred to the Committee of Papers for approval.

Read note from R. C. Gatfield, Esq. presenting Bows and Arrows used by the Hill people about Rajmahl, for which the thanks of the Society were ordered.

Read letter from Mr. Jas. Dearden, Serampore, for whose curious Donation the thanks of the Society were voted.

To the Secretary of the Asiatic Society.

Sir,—If the enclosed Nest or Bag,* which I found on a tree in the Garden of the late Dr. Carey, at Serampore, be deemed by you worthy of preservation, I beg your acceptance of it for deposition among the Society's collection of curiosities. It contained at the time of finding, two or three solitary, common red Ants, (these I imagine, were not the framers) and was disposed between two unfaded leaves which were firmly united round the edges by some adhesive matter, and so compressed, that they expanded at the centre, taking the form of a mango fruit stone. The opening was at the tips of the leaves. During the last six years, I have never observed any change in it.

I remain, Sir,

Serampore, 28th December, 1842. Yours obediently,

Jas. Dearden.

Read the following letter from Major Boileau, of the Magnetic Observatory, Simla:—

Simla, 8th December, 1842.

My dear Sir,—I have the pleasure of sending, through my brother, two more Sets of Tables, one a transformation of Mr. Oltmann's Barometrical Tables, which will be very useful, in enabling the labourers in this department of Physics to reduce all these observations by one common method; and, secondly, a very convenient and portable set of Refraction Tables, which I have extended and enlarged from those printed in the Philosophical Transactions, for 1838. Portable Tables of this kind are still much wanted, and as Mr. Baily has given these (on a small scale and before the publication of Mr. Ivory's second paper, which introduces certain corrections in the former numbers,) they may be looked upon as filling up another desideratum for the Travelling Observer's library.

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* Note.—This Nest was probably the production of a silk-weaving spider, but nothing farther could be ascertained.—Ed.

I remain,
My Dear Sir,
Yours very truly,
J. H. Boileau.

The best thanks of the Society were voted for these valuable fruits of Major Boileau's labours, and the papers were referred to the Editor of the Journal for publication.

Read a translation of ten Sanscrit Slokas, composed by Kamalakanta Pundit, on the restoration of the Gates of Somnath.

Read the Report of the Curator of the Museum of Economic Geology for the month of December.

Report of the Curator Museum of Economic Geology for the month of December.

Museum of Economic Geology.—The following letter from the Right Honourable the Board of Control has been transmitted to us by the Private Secretary, from the Right Honourable the Governor General. It is in reply to the circulars of this department addressed to the Board by our Secretary.

Camp Korna, November 30th, 1842.

Sir,—I am directed by the Governor General to transmit the accompanying letter.

I have the honor to be, Sir,
Your most faithfully,
H. M. Durand, *Lieut. Private Secretary.*

The Secretary of the Bengal Asiatic Society.

India Board, 16th September, 1842.

Sir,—I am directed by the Commissioners for the Affairs of India to acknowledge the receipt of your letter of the 4th July last, forwarding a Prospectus of a Museum of Economic Geology, which has been established at Calcutta, in connection with the Bengal Asiatic Society. The Board are fully sensible of the advantages that may result from the researches of this Society, not only to the Scientific, but also to the Agricultural and Commercial portions of the community, and I am desired to assure you, that it will give them much pleasure to favor the attainment of the objects which it has in view.

I am, Sir,
Your most obedient humble servant,
W. B. Baring.

The Secretary of the Bengal Asiatic Society.

I have the pleasure to state, that we have recovered, through the agency of Major Manson, Political Agent with Bajee Rao at Bithour, four cases of Minerals and Geological specimens, shells, models of crystals, &c. and one Chemical Balance with a Nicolson's Gravimeter, and a small box of blowpipe tests, &c. These, as I learned from

Captain Herbert's Journal, had been made over to his survey from Captain Dangerfield's, and it at last occurred to me to address Major Manson in my search after them. A part, it appears, were sent down to the late Mr. J. Prinsep, but the remainder have now reached us. The specimens are in a sad state of confusion, but I recognise several referred to in Captain Herbert's Journals, and there are many which will either fill up blanks, or be very illustrative and useful in our collections. The apparatus also is in a dilapidated state, but can be repaired, and will all be of service in the laboratory.

Lieut. Yule, of the Engineers, Executive Officer at Chirra Punjee, has at my request obliged us with four bags of the Fire Clay of that locality, to which I propose giving a trial in the construction of the furnaces of the laboratory; a specimen is upon the table. Mr. Mornay, Civil Engineer, from whom we purchased the Minerals noted below, has presented us with a small, but highly interesting and instructive set of fifteen specimens from the Coal field of Burdwan, consisting of the coal, porphyry, dykes in contact with the coal, and petrifactions.—I may notice amongst these last, a splendid specimen of the top of a tree Fern, No. 15, which is now on the table, and No. 4, an instance of coal altered to mineral charcoal, by the agency of a dyke of trachyte. This is not uncommon, but we had no Indian specimens of it hitherto.

I have also to report from this department a first dispatch of specimens to the Honourable the Court of Directors through the Government of India, consisting of a part of Captain Tremenheere's Tin Ores and Matrix from Kahun, Porcelain and Fire Clays, Ores of Manganese and Antimony and Iron, in all 21 specimens.*

Mineralogical and Geological.—Mr J. Pontet, Deputy Collector of Bhaugulpore, has sent us a box of various specimens, principally geological, but his list of localities has not yet been received. He has been good enough to promise us further supplies, and as he is known to be a most active searcher amongst the Coal fields of that distriot, we shall doubtless profit greatly by his kind assistance.

From the Rajmahl District.—From C. P. Gatefield, Esq. we have also a small collection of Geological specimens, carving from Peer Pointee, and some stone Cannon Balls from near the Telleaghurry Pass, which he describes as follows: "These Cannon Balls were dug up about a mile from the Telliagurry Pass, there are 5 or 6 Cannons at this Pass still, and the balls fit these guns; they must have been in use during the Mogul Government. Telliagurry is situated between Calgong and Sicery."

Having been authorized by the Committee of Papers to endeavour to purchase from Mr. Mornay's Collection such part as would be useful to us, I have done so to the extent allowed, and the Minerals are now upon the table, to the number of 90 Specimens for 120 Rs. Amongst these, I may notice the Specimens of Gold Ores from Brazil, as they occur in the various rocks, or with minerals, which are especially instructive for the Museum of Economic Geology. The seven specimens of Diamonds of various Crystallisations, Octohedrite from the Gold Clay, and from Mexico, are remarkable; as are also the specimens of Russian Platina and Platina Sand, and many of the minerals, which are rare, or valuable, on account of their crystallisations.

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* The suggestion of Captain Tremenheere, that the Museum should acknowledge its contributions by an engraved letter, in the style of those of the Royal Museum of Economic Geology, having been approved of by the Society, I have now the pleasure to submit, for inspection, some letters prepared from our own steel plate, with a lithographed form added below it.

As the hour was late, and much business yet before the Society, the reading of the report of Dr. Roer, the Librarian, was postponed to the next Meeting.

A note from Dr. T. A. Wise, B. M. S. was read, stating, that as he intended to proceed to Europe viâ Egypt, he should be happy to be the bearer of any books or other articles which the Society might desire to present to Mahommed Âli Pasha. It was ordered that a list of the Arabic works printed by the Society should be sent to the Hon'ble the President for him to direct what might be most acceptable.

The Hon'ble the President referring to the great loss the Society would sustain by the loss of the services of their talented Secretary, Mr. H. Torrens, in that office, desired the following letter to be read:—

H. Piddington, Esq.
Joint Curator Asiatic Society of Bengal.

Sir,—I beg urgently to request that you will have the kindness to relieve me, pending the ulterior arrangements to be determined by the Asiatic Society, of the current duties of the Secretariat Office.

There is I beg to state no duty among them, with the exception of the collation of certain MSS. of the "Tareekh-i-Nadiree," (now under preparation for the Press,) which requires a degree of attention, which you might find it inconvenient to give.

I beg that you will state to the Hon'ble the President, that this work is nearly completed, and that I will carefully go through the MSS. before laying it before him.

The financial responsibilities of the Secretary will of course rest with me, until I am formally relieved from them.

Under these circumstances, I trust that you may not find it impossible to accede to my request, in which case I shall beg you to lay before the Hon'ble the President the accompanying letter of resignation.

I have the honor to be, Sir,
Your very faithful servant,
H. Torrens.

To the Hon'ble H. T. Prinsep, Esq.
President Asiatic Society of Bengal.

Hon'ble Sir,

Having performed to the best of my ability the duties of the Secretariat Office of our Society for about three years, I now feel myself under the necessity of resigning them, principally by reason of their being now too heavy to enable me to perform them with benefit to the Society.

You are aware that other causes of a public nature operate to confirm me in this step.

During the period of my holding office, I have addressed no Annual Report to the Society of what has been done in the several branches of science in which its Members, and the scientific public of India, are interested. I was diffident upon the point of ranking myself, in a published report, among those whose real attainments give them a personal right to review and discuss the proceedings of the philosopher, the antiquary, and the naturalist.

I need not revert to the period when sudden illness deprived the Society of the invaluable services of your esteemed and lamented brother, James Prinsep, as that in which the interests of the Society were more deeply affected to their detriment, than had perhaps ever before been the case.

He was taken from the active pursuit of his literary and scientific researches, without the opportunity of giving to his successor the means of arranging what was left necessarily in confusion by his sudden prostration, throughout all the departments of science and details.

Professor O'Shaughnessy, who undertook the duties of Secretary, though harassed by unceasing labour, both in the laboratory and the lecture room, was aided in the Oriental Department by Mr. Sutherland, than whom none could be more capable for such duty. He too was, however, as heavily charged with public work, as was the Professor.

It was at the instance of these gentlemen, and more specially of our late President, Sir Edward Ryan, that I consented to undertake the duties of Secretary.

Since that time, the Society has been able to avail itself of the services of two gentlemen as Curators of the Museum, Mr. H. Piddington and Mr. Blyth, and of those of Dr. Roer, as Librarian.

Whatever has been done, has been effected through their agency. I refer you, Sir, to their reports, to the present state of our Museum and our Library, in proof of the good fortune upon which the Society may congratulate itself, in that their effectual services were able to supply deficiencies in another quarter.

To Mr. Piddington, I owe a personal debt of gratitude for much gratuitous labour, by which he has either relieved or assisted me, when public duty or personal incompetency rendered me unequal to the calls which were made on my time, or my qualifications for the post I held.

You are aware, Sir, that I have conducted the publication, called the "Journal of the Asiatic Society" on the same understanding, as did James Prinsep; viz. at my personal risk, though supported by the Society in the matter of subscription at a certain rate for each copy furnished to a Member. I propose to complete the twelve numbers due for the current year, and then to give up the Editorship. Whether it may be expedient that the Society should make the Journal its own, will be a question, Sir, for your future consideration.

In the important matter of our finances, the Society have I trust been fully satisfied, that in spite of a most liberal expenditure, our assets have accumulated.

I must, however, request that you will name a Committee to audit my accounts, and give me a final acquittal of responsibility.

I now, Sir, resign to you my appointment as Honorary Secretary, the duties whereof have been temporarily assumed by my friend, Mr. Piddington, at my urgent request, pending ulterior arrangements; and in so doing, I have to thank you, Sir, and the Members of the Society for the support I have received, while I at the same time apologise for no few errors, and many omissions, which the nature of my public onerous and responsible duties, as well as the pressure of other circumstances rendered it most difficult for me to avoid making. I have the honour to be,

Sir,
Your very faithful servant,
H. Torrens.

P. S.—In emendation of my proposal to have the accounts audited by a special Committee, I beg to submit them herewith for general inspection.

The following resolutions were then unanimously passed on the motion of the Honourable the President, seconded by Sir John Peter Grant.

It is proposed that in acknowledgment of Mr. Torrens' services to the Society, a subscription be entered into for the purpose of presenting him with an appropriate Testimonial.

That an Inkstand appears the fittest Testimonial to select.

Resolved—That the accounts received from the Secretary be approved and passed.

Resolved—That the Society accept the resignation of Mr. Torrens with extreme regret, and offer him their grateful thanks for the services he has rendered to the Society, during his conduct of the important and various duties of the Secretary's office.

Resolved—That in the opinion of this Meeting the Society would not be warranted in recommending to the office of Secretary any person, howsoever qualified by scientific attainments and business habits, who could not also superintend the Oriental Department, and the publications for which funds are furnished to the Society by Government.

That as no person has offered himself competent to superintend both the Sanscrit and Arabic and Persian works now in the press, and proposed for publication, that a temporary arrangement be made until such a competent person can be found.

Resolved—That Mr. Piddington be requested to continue to conduct the duties pending the vacancy of the office.

Resolved—That the Society conduct on its own part the Journal, from the date when it may be given up by Mr. Torrens.

Mr. Piddington signified his sense of the honor conferred upon him, and his readiness to give every assistance to the Society in the conduct of the Secretariat duties.

JOURNAL

ASIATIC SOCIETY

Documents relating to The Gates of Somnath; *forwarded to the Society by the Government of India. With Plates.*

Report of a Committee assembled by Order of Major General Nott, *to report on the state of the Gates brought from Ghuznee.*

Camp near Peshawur, 8th November, 1842.

Considering the great age of these gates, the probable injury sustained by them in their displacement from the temple of Somnauth, and transport to Ghuznee, the circumstances of their having been taken down and buried during the invasion of Affghanistan by Chenghiz Khan, to preserve them from destruction by the troops of that conqueror, and their subsequent disinterment and re-erection, they must be deemed in good preservation. Great care has been observed in their packing and carriage since their removal from the tomb of Mahmood at Ghuznee, and they do not appear to have sustained any material damage from their transport thus far on their return to India.

The tomb of Mahmood of Ghuznee has been for ages a place of pilgrimage, almost of adoration, to Mahomedans, and the gates objects of especial attention; it is not therefore matter of surprise, that the lower portions of the gates within the reach of a man's hand have suffered greatly; the carved work has in some places disappeared, small portions having probably, from time to time, been abstracted as relics. Here and there pieces of carved wood, perhaps of the same antiquity as the gates brought with them from Somnauth, but dissimilar in pattern, have been used to replace the original carving, and in other places inferior material and workmanship have been employed to repair the fabric. But the upper portions of the gates still retain much of the original carving, which is in high relief, of beautiful execution, and in a wonderful state of preservation.

The gates appear to have been formerly decorated with plates of some precious metal, fixed to the wood work round the carved compartments by small slips of iron. Many of these slips still remain in regular patterns, over the top of the gates, lower down they have altogether disappeared.

The frames of the gates are in double folds hinged in the centre, their height is eleven feet, and their aggregate width nine and a half feet.

The gates are surrounded by a framing composed of small pieces of carved wood, united by numerous joints in regular pattern. This portion of the work, though of great age, seems of more modern and slighter manufacture than the gates themselves. The exterior dimensions of their framing, (now in four separate portions,) are sixteen and a half feet in height, thirteen and a half in width. The framing is in very fair preservation, excepting near the ground, where seats seem to have existed on either side the gateway, and the portions of the framing in this position, to the height of a man's shoulders, have been fairly rubbed away. The construction of their framing, and the numerous joints of the work render it peculiarly liable to damage from travelling over rough roads, or from frequent removal.

We are of opinion, that it will not be difficult to restore all essential portions of the gates that are now wanting, and to fix them in serviceable condition in any building destined to their reception; but some judgment would be required to make any repair or restoration harmonize with the air of extreme antiquity possessed by the original portions of the gates.

In consonance with the Major General's request, we have the honor to forward herewith sketches of the gates, with the dimensions accurately entered on the face of the drawing.

The Major General having desired the Committee to state their opinion as to the expediency of conveying the gates in a frame adapted to elephant carriage, we beg to state our apprehension, that such a mode of conveyance might be productive of serious injury to them.

The wood is extremely dry and brittle, and the greatest care is requisite to guard against the more delicate portions of the work being even touched. The gates are not heavy; they do not probably exceed 500lb. in weight, and we estimate the entire weight of the gates and framing at less than half a ton; but their surface is great, compared with the scantling of the frame-work, and the swaying motion of the elephant, and the necessity that would exist for daily loading and unloading the animal, could scarcely fail to open the joints and dislodge the frailer portions of the work, however carefully secured.

We would therefore respectfully suggest, that a car with a double framing between which the gates should be placed, and to which they should be secured by wedges well padded, measures being taken to prevent the entire weight of the gates falling on any portion of their own frame-work, might be expediently prepared at Ferozepore to receive them, such car being adapted to elephant draft. But the gates alone should, we think, be thus carried, the framing being transported to its destination packed as (with the gates) it is at present in felts and tarpaulins. In any case, we would recommend that on their arrival at Ferozepore, both the gates and framing should be carefully examined, and some strengthening by ties and braces given to the slighter portions, to guard, as far as possible, against the chance of small pieces becoming dislodged, and perhaps lost on the road.

In examining on this occasion the framing surrounding the gates, the Committee observed a Cufic Inscription carved in the wood, with a copy and translation of which appended to our report, we have been furnished by Major Rawlinson. We think that it will give an interest to this document, if we attach to it a translation of the inscription on Mahmood's tomb, with which we have been favored by the same distinguished orientalist. Lieut. Studdart has also enabled us to annex a drawing of the sarcophagus, with an exact copy of the Cufic inscription thereon.

(Signed) EDWD. SANDERS, *Major, Eng. and Presdt.*
„ C. BLOOD, *Capt. Bombay Art. and Mem.*
„ JOHN STUDDART, *Bombay Eng. and Mem.*
„ C. F. NORTH, *Lieut. Bombay Eng. and Member.*

*Copy and Translation of an Arabic Inscription upon the Gates of Somnath, which have been brought from the tomb of Mahmud of Ghuzni.**

The same rendered in modern Arabic.

بسم اللّه الرّحمن الرّحيم غفران من اللّه للاميرالا اجا السيّد الملک
المولد اميرالدولة واميرالملة ابوالقاسم محمود بن سبكتگين رحمة
اللّه عليه ولو رحمه له

Translation.

In the name of the most merciful God—(may there be) forgiveness from God for the most noble Ameer, the great King (he who was) born to become the Lord of the State and the Lord of Religion, Abil Kasim Mahmood, the Son of Sabaktagin. May the mercy of God be upon him [remaining phrase illegible].

(Signed) J. A. Rawlinson.

Translation of the Inscription in Cufic Characters on the Sarcophagus of the Tomb of Sultan Mahamud at Ghuzni.

Translation.

May there be forgiveness from God upon him, who is the great Lord, the noble Nizam-ud-din Abul Kasim Mahmúd, the son of Sabaktagin. May God have mercy upon him.

Mem.—On the reverse of the Sarcophagus, there is an inscription in the Neskh character, recording the date of the decease of Sultan Mahmúd, as Thursday, the 7th remaining day (*i. e.* the 22d or 23d) of the month of Rabiel Akhir, A. H. 421.

(Signed) J. A. Rawlinson.

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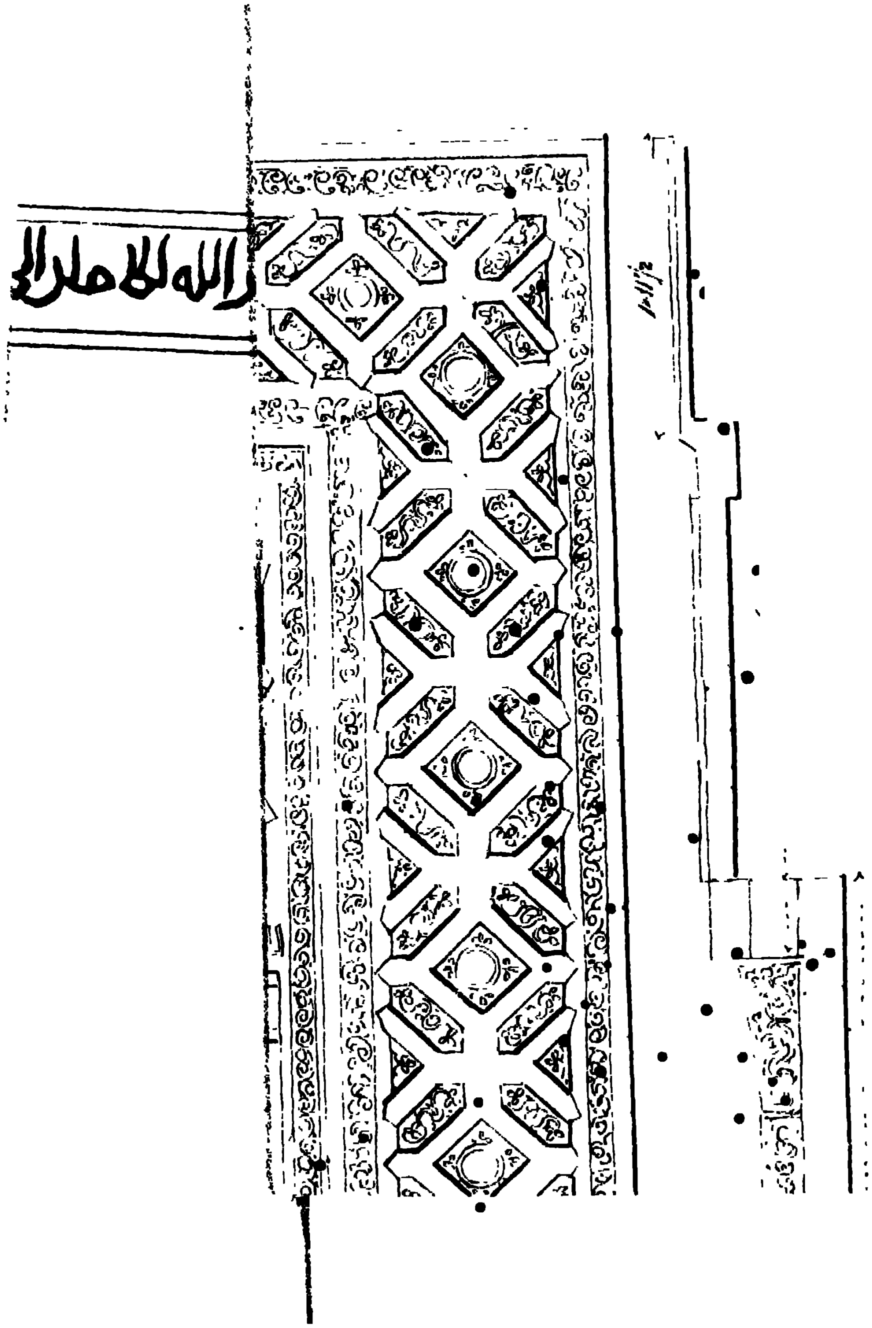
* See lithograph.



الله

Copy in the Suls Character of the Cufic Inscription on the Minaret (Munarah,) nearest the village of Rozah.

بسم الله الرحمن الرحيم السلطان الاك[illegible]

ملك الاسلام يمين الدوله وامين الملة ابوالمظفر ظهيرالمسلمين و

معين المساكين ابي القاسم محمود انارالله برهانه بن سبكتگين غازي

الغازي اميرالمومنين امر بنا هذالعامة العالة العلية قدتمت

باليمن والبركة

Translation.

In the name of God the most merciful.

The high and mighty Sultan, the Melic of Islam, the right arm of State, Trustee of the Faith, the victory-crowned, the patron of Moslems, the aid of the destitute, the munificence endowed, Mahmood, (may God glorify his Testimony,) son of Subaktageen, the Champion of Champions, the Emır of Moslems, ordered the construction of this lofty of loftiest of Monuments: and of a certainty it has been happily and prosperously completed.

Copy in the Suls Character of the Cufic Inscription on the Minaret, (Munarah,) nearest the town of Ghuznee.

بسم الله الرحمن الرحيم امرالسلطان

الاعظم ملك الاسلام اعلام الملة والدولة ابوسعيد مسعود بن ظهير

الدولة المحمود ابوابراهيم نصير الدين اميرالمومنين يمين المملكة

امين الملة مالک رقاب الامم سلطان المكرم الحاقان مولى ملوک

العرب والعجم خلدالله تعلي ملكه و سلطانه وافاض علي العلمين

بره واحسانه غفرالله لاو لوالدى و لجميع المسلمين

Translation.

In the name of God the most merciful.

(Erected.) By order of the mighty Sultan, the Melic of Islam, the standard of dominion and wealth, the august Maso'od, son of the supporter of the State, Mahmood, father of Ibraheem; defender of the Faith, Emir of Moslems, the right arm of dominion, the Trustee of the Faith, the master of the necks of the nations, the noble and imperial Sultan, Lord of the countries of Arabia and Persia. May the great God perpetuate his throne and kingdom, commemorated be his beneficence. May God forgive the sins of himself, his parents, and of all Moslems.

Extract from the Journal of Lieut. J. A. Weller, *Executive Engineer and Officiating Junior Assistant Commissioner in Keemaon, on a trip to the Bulcha and Oonta Dhoora Passes with an eye-sketch. Forwarded by* J. H. Batten, *Esq. C. S., Keemaon.*

26th May, 1842.—Milum. Up early, and started at 4h. 20m. A. M. after *burral*, a herd of which my shikaree had seen the previous evening on the N. E. side of the hill behind Milum. For some reason, Nagoo and Dhunsing, who were acquainted with the country, wished me to ascend the hill behind Milum a little to the West, and then go over the crest after the *burral*; I consented of course, and believe my bad luck in not killing any thing, was owing to this mistake. For when I did see the *burral*, it was late in the morning, and they were ascending the hill where my shikaree had seen them, after feeding; whereas had I gone round to the N. E., I should most probably have seen them feeding low down early in the morning, and had a fair chance of one or two good shots. However, at 5h. 5m. I reached the top of hill visible from Milum, by a dangerous sheep track, thence up a continuous slope of moderate steepness, affording plentiful grazing to sheep and cattle, a few of which latter (jooboos) were feeding; continued ascent till 7h. 5m., when I halted for a cheroot and some biscuits. Dense clouds, and a heavy drifting haze shut out the surrounding hills from view; this I much regretted, as being North of Nundee Devi, and at a good elevation, I might have seen a magnificent view of that mountain and its neighbouring peaks, had the sky been clear. Possibly also, I might have seen Oonta Dhura. Small flakes of snow fell now and then, and the weather was very cold. At 7h. 42m. started again up the ascent, and on till 9 A. M., when on the side of a hill North of me, and separated by a rather steep descent, one of my party spied a herd of sixteen or twenty *burral*. We all lay down immediately, and crept back over the crest of the hill, but unfortunately the *burral* had seen us, and commenced slowly ascending the hill. I made the best haste I could up the hill, keeping its crest between me and the *burral*, until arriving at a spot opposite to where they were in a snowy hollow. Now I should have gone still higher to a cragged peak, and left a man to go below the *burral*, and drive them up when he saw me at the top. Instead of this, the shikaree thought I could get close to them by creeping across the intermediate space, covered by the side of the hollow in which the *burral* were. I did as he wished, but the space we had to cross was landslip, from which stones occasionally rolled down in spite of all our care. The *burral* must have heard these, and were ascending the opposite side of the hollow; when getting sight of me, they made towards the crest of the hill at once. I saw them pass over, each in turn halting for a second or two upon a small rock; but a thick haze was drifting between them and me, and constantly shut them out from my view; owing to this haze, the distance appeared to me greater than I afterwards found it to be; and as the *burral* are seldom to be approached a second time after once being alarmed, I put up the second sight of my rifle and took one shot when the haze was rather less dense than usual; missed, the bullet probably going too high, and almost immediately the haze shut out every object within ten yards of me, so that I could not get a second shot. The shikaree ascended the hill as fast as he could, but was unable to perceive where the herd went; and after going up to the crest, I halted at 9h. 30m. for a cheroot, infinitely disgusted with my bad luck in not getting one decent shot; for firing through a cloud can hardly be called one. Started at 9h. 48m., made a slight sweep round to the West for the chance of seeing the *burral* again, but in vain, and commenced the descent to Milum. The hill side was not very steep, and consisted of one immense sheet of loose slate, an incipient landslip in fact. I descended very fast almost at a run, snow falling and biterly cold, East wind blowing. This changed as I got lower down, and the sun was intensely hot, so that I was glad to find myself back at the village at half-past twelve, after nearly eight and a quarter hours' exertion, seven and a quarter hours of which were incessant travelling. The sun when it does shine out is very powerful, or rather it feels so, and my face is now half raw, and the colour of a beefsteak. The pain and annoyance of this is all the inconvenience I have yet felt, and my health and strength are (thank God) first rate, a state hardly to have been expected.

After breakfast, I was much surprised to find that the Lama* had suddenly made up his mind to start for Tooling, and had left with six ponies and two servants shortly after I started in the morning; no person was acquainted with his intentions, or can give any explanation for his sudden departure. The Lama's remaining two or three servants, who were to have followed with some goats, &c., treated themselves to a jollification upon the happy event of their master's return, and are now all dead drunk. In the course of the afternoon, they came to where I am living, and one man commenced singing by no means unmelodious songs, accompanying himself with motions of the hands, feet and body, exactly similar to those of nautch women at Almora, or in the plains. Another fell down with an awful thump on the hard stones, but was picked up unhurt and laughing. I was rather glad when they were persuaded by me to go to sleep. These people started early next morning. Nagoo describes them as wonderful travellers, and says, they think nothing of ascending Oonta Dhura with a heavy load.

27th May.—Had a long sleep after yesterday's fag, and did not get up till 6h. 30m. A. M. Though if my heel had not been galled and face so very painful, I should probably have tried the *burral* again. Morning very mild and pleasant. Ther. 55° and no wind, but about 10 A. M. an East wind sprung up. Seven or eight jooboos reported present, and the remainder faithfully promised by evening, so that I may start to-morrow morning. Busied myself during the day in selecting clothes, &c. for the trip, and in making a plan of the country beyond the Pass, according to Nagoo's information. Ther, in the sun at noon, 80°;

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* The Lama of Tooling, a refugee to Almora during the invasion of Thibet by Zorawur Sing and the Sikhs, and after the spoliation of his temple by them.—J. H. B.

about 11 o'clock it was 5 or 6 degrees higher. During the morning, I endeavoured to obtain some information as to the country beyond the Pass, but a number of people being present, I did not like to ask such minute questions as would enable me to map down places with any degree of accuracy, and the inattention of the Boteeas with reference to north and south, renders it difficult to obtain correct ideas of localities from their information. Nagoo produced a map, of which I may make something when I can get him quietly alone. At 2h. 50m. I started to see the Sunchee Koond, a small sheet of water some distance up the glen of the Goree river, held in great repute as a place of pilgrimage. I reached it 4h. 45m. travelling slowly along a gentle ascent, intersected by numerous water-courses from the hill on right, (North,) and found it to consist of a small triangular-shaped piece of greenish water, perhaps 100 yards by 80 in its largest dimensions. I had no means of ascertaining the depth. The mass of desolation, as described at the source of the Goree, continues thus far up; and how much farther no one can, or will, inform me. The fissures hereabouts are narrow, instead of being crater-like; and the ice where visible is more nearly the color of snow. On the opposite (South) side, huge accumulations of ice and gravel are to be seen in the openings between the hills; and generally, the sides of the hills in this vicinity do not appear so much cut up by landslips as lower down. The weather was very cloudy, and bitterly cold, with a few drops of rain occasionally. I had no opportunity therefore of gaining a view further Westward, or on either side to any extent, but I consider this glen would amply repay a few days devoted to its inspection. Once on either side, I had a view of the old ice high up on the hills; and its light sea-green color, with strongly defined and fantastical lines of shape (castles, stairs, &c. &c.) formed a very pleasing and grand appearance. I returned to Milum at 6h. 25m. P. M., and found matters progressing; likely to ensure my departure upwards to-morrow morning.

The only weighing implement I have seen this side of Munsharee was a steel-yard at Milum, and I was told that it came from Tibet, where they are commonly used.

28*th May.*—Up at 4h. 20m. A. M., ther. 49° in the sleeping room, morning tolerably clear and mild. Much delay occurred in loading the jooboos, but at last all was ready, and I started for Doong at 6h.

25m. A. M. I had with me two servants, (a kitmutgur and shikaree boy,) my bedding, (no bed,) some clothes, powder and ball, a little wine, &c., and very scant preparations for eating, the whole calculated for an eight days' trip. Nagoo Boora, Dhungsing, Geitsing, a road chuprassee, and the Luspa shikaree, with four coolies, (hired at four annas a day each after much bargaining,) accompanied me. We had fifteen jooboos; viz six for riding on, and nine for three tents, my bedding and clothes, wood, &c. Two of these were very lightly laden, in order to bring back any skins or horns I might procure. One of the coolies carried my wines cheroots, &c., a very light load, and the articles not packed upon the jooboos. I had a sore heel from the shooting excursion of 26th, and could not walk without feeling much pain, I therefore started in the *dandee;* but the road was so infamously bad, that I was soon compelled to walk as best I could. At 7h. 7m. came to the first snow-bed over the Goonka river; at 8h. 20m. near Lungon river saw two *burral,* but they were some distance up the hill, and saw us approach, when they immediately ascended and disappeared over the crest. The sun was powerful, and my heel very sore, so that I did not incline to follow these *burral* even had the hill been easy, instead of being almost inaccessible. At 8h. 55m. reached the Sungon Nuddee coming down from the East, two magnificent snowy peaks were visible in the direction of its source. This small Nuddee has salt, or something of the kind, on its banks a short way up, and *burral* resort there, before the passage of sheep and goats upwards drives them to more remote places. Probably had I been here early in the morning, the two *burral* I saw, would have been feeding near the Nuddee, and afforded an easy shot. I crossed the Sungon by a small temporary bridge, and halted at 9h. 5m. for the jooboos to come up, feeling very tired; sun unpleasantly warm to the skin, though not high I fancy in actual temperature I started again at 9h. 30m. and at 10h. 15m. reached Tulla Sulong, a small rather level spot, furnishing a little grass. Halted here to breakfast, and let the jooboos feed before moving on to Doong, where there is no pasturage for cattle. Slept till half-past twelve, when breakfast was ready. A strong South wind blowing, with dust in abundance. Opposite Sulong, on the right bank of Goonka (West) is a tolerable waterfall, or rather series of cascades from the top to the bottom of hill. The road thus far, (alternately on either bank of the Goonka, but chiefly on the left,) infamously bad. The hills on either side a series of dreary looking landslips or bare sheets of rock; and in the rains, when Bhoteeas travel up and down, this road must be really dangerous from constant landslips and falling in of the banks. Hardly any snow visible on the hill sides; and Oonta Dhura itself is nearly equally bare, if it is the hill pointed out to me when about half way. Ther. 77° in tent, at 1h. 30m. P. M.

Riding a jooboo is by no means a bad mode of travelling. You sit comfortably in a high demi-pack saddle,* which affords a capital hold in front; a man leads the jooboo by a string passed through its nose; and the pace though slow is very sure; two or three times during this trip my jooboo fell, but no harm was done. In general, it is wonderful what difficult ground they will carry a man over. Jooboos laden in fifty minutes, and we started again at 3 P. M. Weather had become cloudy and cold. At 4h. 40m. crossed to right bank of Goonka river by a natural bridge formed by three rocks, with fissures filled in by loose stones where requisite, and at 4h. 45m. halted at Doong, (no village,) a little West of the junction of the Goonka and Lusher rivers, which come down from the N. W. and N. E. respectively. The Goonka is covered by a huge mass of ice and stones, 4 or 500 yards higher up; and so doubtless is the Lusher, though not where it is visible from Doong. Road very bad; hills on either side nothing but landslips or bare precipices, with very little snow visible. I had one fine view during the afternoon march of a huge mass of ice in the most fantastic shapes, behind three peaks West of the Goonka; but with this exception, the prospect everywhere was most desolate, and above Doong, it is, if possible, more so. Not a shrub, and hardly a blade of grass visible any where. One eagle, two or three of the chough birds, and as many smaller birds, were all the signs of life met with. There was formerly a shorter road to Chirchun up the Lusher river, but it has been abandoned as too dangerous from new snow covering fissures in the old ice, and yielding when trod on, thus instantaneously precipitating man and beast down a narrow fissure, heaven only knows how deep. Latterly, when men have attempted this route, they did so with a stout long stick tied to the waist, in order to catch the sides of fissures, and thus afford a chance of getting out again. This might answer when the stick happened to be transversely to the fissure; but when lengthwise with it, would be no avail. I suggested an improvement to Nágoo, (who told me this,) viz. tying two sticks cross-wise to the waist, and thus ensuring that one of them would catch the side of the fissure whichever way it ran; but these sticks would be a most awkward incumbrance to walking in such hills. Just as we reached Doong, two or three men were seen in the distance going towards the Pass. They would sleep on the road if unable to cross before dark; but the very circumstance of their attempting the Pass at so late an hour, would seem to prove, that its difficulties have been much overstated. I shall (D. V.) be however more qualified to judge by this time to-morrow. At 5h. 55m. P. M. ther. 52½° in open air, boiled at 188½°, elevation (by Barron*) 14.523. Surely this is too much. ? The rate of travelling to-day may have been 2¼ to 2½ miles an hour.

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* The pack saddle used for jooboos is an excellent one; and I took one down as a pattern, in event of one's requiring to use bullocks or ponies as baggage animals.

29th May.—Up at 4h. 30m. A. M., after a very bad night's rest. Ther. 35° in sleeping tent; boiled at 189°, which would reduce the elevation, noted from Doong yesterday, to 14,214 feet. Started at 5h. 10m., morning deliciously clear, but very cold with a light West wind. Ascent till 6h. 15m. up mass of ice and stones, close under hill to N.E., quite bare of snow. The hills to S.W. from a quarter to half a mile distant being tolerably covered with snow. The top of this ascent is where Batten turned back, yesterday twelve month, on account of snow falling and being thick all round. What a contrast to this year! From 6h. 15m. to 6h. 45m., a slight descent, and then along level snow-beds with the Goonka river, now a very small stream, flowing on my left. There had been very hard frost during the night, and every little pool of water was covered with from a quarter to half an inch of ice. Snow very firm and crisp. I had walked for the three-quarters of an hour, and now halted for the people to come up. Started again at 6h. 55m. up a steep ascent of loose stones, &c. (called Bumras;) reached the top at 7h. 15m. and then turned to the right Eastward. Some fine masses of ice on hill to left or West. The soil on the top of Bhumras, and in advance, almost black. Oonta Dhura was visible after turning Eastward, and seemed to be a low black hill, of moderate steepness, with more soil than snow visible. But its continuations East and West were finely covered with snow. Continuous though not steep ascent till 8 o'clock, when I reached the foot of Oonta Dhura, (called Oonta ke Jum,) where people generally halt before cresting the Pass. A small rill of water goes down to the S. W., and probably forms the source of the Goonka river. Road (or track) thus far chiefly over snow-beds, said to cover enormous masses of ice; these melt and split into fissures during the rains, causing much inconvenience and danger to travellers.

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* Mr. Barron of Shahjehanpoor, a great traveller in the hills, gave Lieut. Weller some table for calculating heights by the boiling temperature, and this is always alluded to.—S H. B.

I resolved on walking over the Pass to ascertain how my breathing would be affected; and started without making any halt at the foot. The ascent was longer than I expected, but I walked very slowly, halting every now and then for a second or two, so as not to lose my wind, and at 9h. 15m. A. M., reached the summit. The hill side was very wet, but whether from snow recently melted, or from springs below the surface, I know not. During the ascent, I certainly felt my breathing slightly affected, and had I walked fast the affection would probably have been severe. In going over the Luspa hill on the 24th instant, I felt much greater distress, but there I travelled quickly, and the sun was more powerful. During my ascent of Oonta, the sun shone out with great splendour; and the dazzling brilliancy of the snow on either side was truly wonderful. I had never seen or imagined any thing comparable to it, what then must be the effect when nothing but snow is visible in every direction? The Booteeas all put on thin horse hair spectacles. I had on a pair, and a green veil also, but my eyes soon became painful, and I was almost stupid from pain before reaching the halting place of Topee Doonga. What may be the difficulties of this Pass after a severe winter, I of course cannot judge; but it would be absurd to speak of difficulties this year, (except the minor ones of cold and glare); and I feel certain that I could walk from Milum to the summit of Oonta Dhura in one day; the only drawback being the fearfully bad road.*

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* At the foot of Oonta, snow pheasants (huoneal or huonwal) were calling, but high up in the snow. It is hard to imagine what these birds live on, there not being a berry or particle of vegetation for miles round. Yesterday a man brought me seven

On the Pass the ther. when taken from its case was 45°. It rose in the sun to 61°, and boiled at 182°, or a little under, snow being used instead of water. The elevation by Barron's rule would be 18,540 feet; but this must be greatly in excess. There are five small ridges of stone in the crest, which look like pillars from below. It is believed that a ghost kills any one who sleeps near them; but more probably cold is the agent. There was a bitter cold wind blowing, and it is described as awful towards the end of the rains. Dhunsing told me, that in September twenty-five years, ago, he lost 120 sheep swept over the North face of the Pass by the wind. His servants escaped to Milum with great difficulty; and the borax with which the sheep had been laden, was recovered next season. The south face and crest of the Pass consist of a black soil, apparently the detritus of a black slate, which latter is visible here and there below the soil. I was much disappointed with the crest of the Pass. The view South is very limited. Nundi Devi not visible, North-East and North a few hills are visible, North-west is a sea of hills moderately covered with snow, and hardly any of them appearing of great elevation. Indeed, were it not for the Louka river, (a small stream,) rising at the foot of the North slope, and flowing due North, I should have been sceptical as to standing on the crest of one of the few Passes into Tibet, and the highest one too. North-east are three bare hills, the first called Gentee, with behind it, not visible, two other hills, which have to be passed on the direct route to Chirchan. I know not what is the name of the centre hill, the third is Chingoor. North, in the distance, is the Balcha ridge, the last range between Hindoostan and Tibet, with intermediately a high gorge above (south of) Chingoor, connecting the hills East and West. From North to nearly West, there is a decent assemblage of hills well covered with snow, (those N. E. and N. having very little). The highest of these is a conical peak above (North of) Gertee, where copper* is said to be found. This peak bears about due N. W. from the crest of the Pass. Gintee is on the road from Mularee below the Neetee Pass, but to reach either Gertee, Mularee or Neetee

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eggs from the nest of one of these birds, and wanted me to eat them. I declined this, and he enjoyed them for his own dinner, cooked up somehow with ghee. The eggs were nearly as large as turkey's eggs, white, with lightish-brown spots all over.

* There are lead mines at Ghentee.—J. H. B.

from Jawahur, without going round by the South, you must cross Oonta Dhura, of which I was not before aware. At 10h. 10m. A. M., I commenced descending the North slope of Oonta Dhura, one unbroken sheet of steep snow till 10h. 37m. Thence moderate descent, chiefly over snow-beds cut into most troublesome ridges by the wind, till 11h. 35m., when I crossed to left bank of Louka river. Continued along this bank over snow-beds and bare hill sides, till 12h. 45m., then turned sharp to left (West,) and after the worst descent I have yet had, through snow and slush, reached Topee Doongah. Halting place (no village) at 12h. 58m. awfully tired; face blistered by sun and wind, and eyes very painful. Topee Doonga is a small level spot on the left (South) bank of Louka river, which latter turns to the West where I did, being joined there by the Doldunkur Nuddee coming from East, between the second and third Hills, noted as visible to N. E. from the crest of the Pass. There is a little herbage at Topee Doonga, and further West, grass and low brushwood (on the opposite side) are tolerably plentiful. South, the hill sides are covered with snow, and recede gently for a short distance North; across the river is one bare precipitous sheet of rock, with landslips along the base. East is the West face of the second hill mentioned above, equally bare and precipitous, with the Doldunkur Nuddee coming down between its North, and the South side of Chingoor hill. West, about three-quarters of a mile down, the united Louka and Doldunkur streams are joined by the Torgurh Nuddee coming down from S. E. by S. These united, flow on Westwards, through a wide gravelly channel to Gertee, where another stream joins, and the whole flow on to Mularee, Josee Muth, &c., forming I imagine the Geenthee river, marked in sheet sixty-six of Indian Atlas. The junction of the Torgurh and Louka is curious.

They flow nearly parallel for some hundred yards before the junction, the former along the top, and the latter along the base of a precipice, which may be 150 yards high at its highest point, and diminishes to nothing at the junction. At 6h. 30m. P. M. ther. 46°, boiled at 186½ or 187°. Next morning at 5h. 30m. A. M. ther. 28°, boiled at 186½° or 187½°; elevation of Topee Doong (a bitter cold place) from 15,759 to 15,450 feet by Barron's rule.

30th May—Up at 5 A. M. ther. 27°* in my sleeping tent, but as there was no wind, I did not feel the cold so much as on the top of Oonta Dhura yesterday, where the ther. was 61°. Saw a large raven (size of the English raven, or very near it;) but could not get a shot at him. Started at 6h. 50m. A. M., descended to river, then turned up East along it, and at 7h. 8m. A. M. crossed the Louka, just above its junction with Doldunka, stream rapid, but not above knee-deep, and some twenty feet wide. An East wind had sprung up about starting time, and brought intense cold with it. Shortly after the wind lulled, heavy clouds to N. W. and South, and a light snow falling, and continued up the Doldunka, chiefly flowing under snow between two steep sheets of rock, till 7h. 35m., then turned up left (North) to the Kalee Mutteea Churhai; very steep, covered with loose stones over a black crumbling slate. The latter part of ascent was less steep, but without holding on by a jooboo's tail, the whole of it would have been a most tedious job. I picked up a few bad fossils by the way; also pieces of a thin cylindrical slate-coloured stuff, called *doda ka puthur*, (milk stones) and used by the Booteas as an application to swelled nipples in women. Reached top of ascent at 9h. 15m. (This is the intermediate gorge mentioned as visible from Oonta Dhura.) Occasional snow beds during the latter part, hills on either side bare precipitous sheets of sand-stone. Had a good view of Oonta, and took a rough sketch, to be perfected hereafter, perhaps.* The crest is composed of small loose stones rising in a sweep to the top of the hills on either side (East and West) North beyond a good extent of valley and low hills covered with brush-wood, rises the Bulcha range, beyond which are the plains of Tibet. This range is here and there streaked with snow. The hills from Oonta, thus far, seem chiefly of brown sand-stone. The strata mostly dip East, and are very vertical. I observed some strata here and there. On the crest here I picked up a good sized piece of white alabaster-looking stone, very soft. The Booteeas consider it of value, call it *huon phool*, (snow flower,) and dissolve it in water with two or three medicines as a lotion for sore eyes, &c. &c. Commenced the descent to Chingoor, (a halting place only,) at 9h. 40m.; route lay about due North over alternate snow-beds and loose stones from the hill above (E.); and was bounded E. and W. by two high ranges of (I think) bare sand-stone, with a small stream flowing North in the hollow between them, chiefly under snow-beds. The hills on either side are perpetually crumbling away, thus forming immense heaps of loose stones all along their bases. There was a good deal of snow on the North slopes of the ravines (or khunds) and otherwise the prospect was extremely desolate. At 11h. 55m. reached Chingnoo, after a most tiresome and hot descent. Nagoo, &c. wanted to go further, as but very scanty forage was procurable here for the cattle, (the first vegetation we had met with since morning); but I was quite tired and would go no further before eating something. Chingnoo is a small level spot on the right or East bank of the stream noted above; and on the left or South bank of another stream coming down from the East, and joining the former one here. The united streams turn West a mile or two in advance, and eventually join the Louka, &c. by a cut through the hills near Gertee. Just north of Chingnoo, across the stream, a succession of low hills commence extending northwards to the river below Lufkhel. These are covered with a low creeping thorn, (called *damah*,) which is found to within two or three miles of Milum; and the hollows afford very good pasturage. Just as we approached Chingnoo, the Lama, (who had been encamped somewhere near us at Topee Doonga yesterday,) was seen starting on his march from Chingnoo, with his small party, seven or eight men, and half a dozen ponies. These ponies must be really good ones to have come thus far without accident; but they were knocked up by the Pass, and compelled the Lama to halt yesterday. This was very fortunate, for I cannot attribute the Lama's sudden departure from Milum to any thing but fear of my crossing the Pass; or to a desire of stopping me by going ahead, and giving information. After breakfast, we shall move on until we come up with his party; and then by counting his people morning and evening, all fear of annoyance will be obviated. Eloquence will also be exerted to convince the Lama, how unjust it would be to cause me trouble after the kind reception he met with in our territory; and he will be threatened with non-admission into our provinces again, should he cause the Booteeas trouble on my account; so I hope we may manage him yet. Altogether though, I do not quite like the state of affairs, and glad enough shall I be to find myself safe again at Milum, after a view of Tibet and a little of the glorious sporting said to abound hereabouts. "*Rheow* is the talismanic word to make a jooboo quicken his pace, though a whip has better effect. Safe as they are, my jooboo has fallen three times with me; but no where in very dangerous places, and no harm done.

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* Compare with Calcutta same hour and same date.—J. H. B. Probably not below 85°—Ed.

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* See Sketch.

Snow-beds are always most difficult at the sides, the middle being generally firm and hard.

Pace to-day one and half mile an hour, or possibly a little more on the whole. Yesterday one and quarter to one and half mile; and the day before about two and half miles an hour.

Bootea tents all blanket, or upper part blanket and lower part cloth. A strip of about six inches wide is left open along the top to let smoke out, the rains never being heavy enough to cause inconvenience from such an opening. Dhun Sing tells me, that just now it is so hot below Dhapa, that sealing wax melts if carried on the person during the day!!! (?) The appearance of hills looking at them from South and from North is widely different. Looking from the South, you see only the South face of ravines, &c., on which hardly a trace of snow will be visible. But looking from the North, you see only the North slopes; and these are generally covered with snow, giving the entire hill the appearance of being so covered.

At Topee Doonga this morning, I saw a tolerable number of larks, or some small bird of this sort; also one or two of the small purple black birds, a specimen of which I unfortunately failed to procure. At Chingnoo, several choughs were flying about; their call exactly like the cat-call used by young blackguards at home. At Chingnoo, were numerous burrows of the "*pfheaf.*" This animal is described as smaller than a dog, of a reddish colour, sits up at the mouth of his burrow, and remains dormant in the winter. It must be a squirrel; much to my vexation I failed in even getting a sight of one. At Chingnoo 2h. 30m. P. M ther. 68° in shade of tent, boiled at $186\frac{1}{2}$ or 187° elevation (by Barron,) 15,759 to 15,450 feet.

30th May.—At 3h. 25m. P. M., the servants started for Lufkhel, and I went with Nagoo across the Chingnoo stream, and along its west bank to look for *burral.* After some time, I saw three on the hill side, a long way off and far up; had a long sneak, but found the hill side so steep, that when within fifty yards of the *burral,* I could not depress my gun sufficiently to fire at them standing under a rock. They immediately got sight of me and rushed off, so I only had one long running shot, and missed. We then turned down into the bed of the stream, and walked for some distance along the snow-beds covering it, between high steep cliffs. No more *burral*, however, were visible, and it became time to move on. Turned up East over some low hillocks, most pleasantly covered with stunted palm trees* in flower. The low close thorn also in flower, yellow-shaped, like sweet pea flower†. Now and then the iris of deep or pale blue color, a sort of wild garlic which the Bhooteeas eat, in appearance just like iris or narcissus shoots; "*dooloo*," I think *rhubarb*,‡ and most delicious looking emerald colored young grasses, fringing little rills of water flowing between the hillocks. Hereabouts I saw a small dry water-course coming from the top of a low isolated black hill (bare ;) in the bed of this were numerous salagrams, which had evidently been washed from the soil during rain. I picked up thirty or forty, and could have found hundreds, but time admitted not. Very few of the specimens were perfect, as they get broken when rolled down by the stream; but I should think perfect specimens could be obtained by digging. Salagrams are formed by an incrustation of (probably lime) stone enclosing the ammonite in a spherical shape, of all sizes, from a marble to a man's head nearly. These cases as it were, burst either from some agency within themselves, or on being set in motion by water falling, &c. and display the fossils. Yet among the numbers that I broke, (they were very hard,) I never found a decent specimen inside, and rarely even the trace of one. In all of these I suppose the originally enclosed shell must have been decomposed and absorbed by some peculiarity in the chemical nature of the enclosing mass. After continuing East for some distance over the same kind of ground, (said to be usually a favorite resort of *burral*, though none were visible at the time,) I came upon the road to Lufkhel; and while descending to the river saw a little East of the road, a small triangular sheet of deep blue water, perhaps eighty yards long each side. North (in advance) across the river about a mile off, another sheet of water was visible, less darkly colored than this; two or three rills of water flowed down along East of road to the river, the bed of which, including debouchements of these rills, is fully half a mile wide, formed of loose stones and gravel.

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* Probably a kind of willow is here meant.

† Tartaric furze and juniper bushes are the thorny plants in the Passes.

‡ Yes.—J. H. B.

At 6h. 50m. P. M., reached the river flowing from East nearly due West, and joining the Chingnoo stream about a mile or less below Lufkhel, after passing through a magnificently bold cleft in the hill of solid rock for many hundred feet of perpendicular height. This river comes from the hill North of Lufkhel in several small streams. These unite somewhere to the East, and had been swollen, either by rain or some other cause into a rapid torrent thirty or forty yards wide, through which the jooboos carried us with very great difficulty. In fact it was dangerous work, but this rapid rise will probably decrease very speedily, as the river is usually fordable by sheep. I reached Lufkhel at 7h. 10m. A. M., much fatigued. This is a pretty halting place (no village) a few hundred feet above the river, shut in by an amphitheatre of low hills, which form the base of the last range before Thibet. The thorn bush (damah) is tolerably abundant, and the hollows are covered with deliciously emerald-colored young grasses. The place is a favorite pasturage, and during the rains some of the nearest Thibet villagers pitch their tents here. Lufkhel and Topee Doongah were the refuge of numerous Thibetans, when the Seiks advanced last year.

My servants and jooboos had arrived sometime before me, after two and three quarter hours' travelling from Chingnoo.* Their road was excellent, and lay over a succession of the small hillocks I have described. The Lama was encamped at Lufkhel in a great state of alarm, and very indignant with Nagoo and Dhunsing, (whom he knew well,) for having brought me across the Pass. Fortunately, his people were all present, and Nagoo had no difficulty in persuading him, that I had come solely for shooting, and did not intend to advance further. Two men had just arrived from Dhapa or thereabouts in search of the Lama, bringing ghee and rice for his consumption. Their only news was, that the Lhassa force of from 5 to 7,000 men had moved on Ladakh, where the Seiks continued to hold out, and would probably have reached ere this date. These two men were stupid fellows, and had not been within many days journey of Lhassa, so that their information is deserving of but little credit. The general impression is, that the Lhassa force, even if it has moved, will not be able to capture the citadel of Ladakh from the 300 Seiks holding it.

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* At and about Chingnoo, there is a little, grass for cattle, and I found one salgram here. I saw also the foot-print of an animal called "*chunkoo.*" This I had supposed to be a small tiger, but from subsequent description of the color, hunting in packs, and lolling out the tongue when fatigued, it must be the wolf, and judging from the foot-prints, of large size. The "*chunkoo*" will kill jooboos, also whole flocks of sheep and goats if left untended. It also hunts the *burral*, but is said never to attack a man. The "*thurwah,*" is a smaller animal, slightly marked like a tiger, and hunts singly. (Perhaps Felis *macrocelis* hitherto supposed to be confined to Sumatra, but of which a specimen has just been received in our Museum from E. B. Ryan, Esq. who obtained it at Darjeeling. Eds.) Possibly I may yet see these animals. The two streams at Chingnoo have rather wide gravel beds, denoting a large body of water at some period of the year.

Much to my surprise, Nagoo informs me, that the jooboo will breed, either male or female, with the cow or bull. The produce is called "*toloo,*" is but little used, and I fancy but rare. Nagoo could not tell me where one was to be seen.

31*st May.*—After a horrible night's rest, dreams of wonderful ascents and descents, &c., I rose at 5 A. M. and prepared for a hunt after *burral.* Ther. 36° in sleeping tent, boiled at 188¼°. Elevation 14,523 feet. I crossed the river and ascended a rather steep hill West of the road, when on the other side, much to my delight, I saw five or six *burral.* The first that caught my eye was lying down at about ninety yards. I took a good aim with the long rifle, and hit him in the middle of the back. He jumped up and stood, the others running off, I fired one barrel of my double gun, (I thought I missed,) the bullet of which entered the jaw a little below the eye, still the *burral* stood, and it seemed doubtful whether I should get him, though he was pouring blood; but my long rifle was now ready again, and after numerous attempts I was satisfied with the aim, and rolled him over, to my infinite delight, with a ball in the side. Thinking the others might not have gone far, I left the fallen *burral* where he lay, and ran along the crest of the hill, and on the South face I saw four or five more standing very far down; knowing it would be useless attempting to get nearer, I put up the second sight of my rifle, and took a long steady aim at one standing lengthwise from me. He dropped to the shot hit fairly in the centre of the back, and I do not remember ever to have been so delighted with my shooting. The distance could not have been less than 160 yards. The remainder stood for a second or two, watching this poor brute's struggles to rise, and then made off. Two more, and a herd of seven or eight more made off, so that I had no chance of another shot, and prepared to return, having much to my delight bagged two *burral* (my first) by seven o'clock. Returning, I saw a brace of snow pheasants, but could not get near them. These birds in a mild season must be difficult to kill. They shew some white along the wings in flying, are of a good size, and have a melancholy sort of note, which they continue at intervals nearly all day. I got back to Lufkhel at 10h. 30m. much fatigued. Ther. in tent 87°; at 11h. 45m. 88°; and 90° at half-past 12; after which it became rapidly cooler. My success with the *burral* this morning was doubly fortunate, as it convinced the Lama I had really come for shooting, and enabled me to propitiate himself and people by the present of half of one of the *burral*, which highly delighted them. The Lama foretold I should have success in the morning, and was hugely pleased to see through a small pocket telescope he has, that I had been successful, as I descended the opposite hill in returning. Both *burral* were females, and had consequently only small horns. The second killed was, I fancy, fully above the average size, and measured as follows:—

	Ft.	*In.*
Height from hoof to centre of shoulders, ...	2	10
Length from nose to insertion of tail, ...	4	1½
Girth behind fore legs, ...	3	1½

Color light brown, and nearly white on the belly. Dark brown stripes down the front of the legs. Hair, something between hair and quills, like what I fancy the softer parts of a porcupine's covering. May be weight about 1½ maund, just as much as a strong man could carry after the entrails were taken out. But in October, when they are fat, probably some of the large males would weigh 2½, or nearly three maunds.

Plenty of salagrams at Lufkhel; maunds could be collected in a day. I should have mentioned that the Lama requested me to take some of his tea this morning. I agreed, and it was served in a quaint copper tea-pot, exactly like an old fashioned coffee-pot. I drank about a pint of the decoction, which was chocolate colored, rather greasy, and of by no means bad flavour, though it had a peculiar twang which I can liken to nothing I remember to have tasted. The soda mixed with the tea is said to color it like brickdust or chocolate. When to be had, both sugar and milk are used with their tea, but this had neither. One of the Lama's men was amusing himself by slinging stones at ravens and two large vultures during the day, but he did not project the stones with good aim, or to any considerable distance. Perhaps he was a bad hand at it. The sling was made of plaited hair. At 3h. 30m. I started northwards up a gentle ascent or two, (salagram hillocks,) and then turned West over a series of most lovely undulations. Some bare, (salagram hills,) others covered with the thorn bush, and rills of water, with superb pasturage in the hollows between. This style of country extends I know not how far, and might be ridden over at a rapid pace. It is bounded south by the range of hills which I noticed to the N. W. from Oonta Dhoora, particularly mentioning the conical hill above Gertee, which is now nearly as far South as it then appeared N. W. of me. These hills appear very steep and rocky, and shew much snow on their north side. The breadth of this tract may be two or three miles at most, and it is bounded north by the last range before the Thibet plains, rising into bare steep precipices. I was led here by a report that a wild horse had been seen in the morning, but it subsequently appeared, that the man sent to look out, had seen only the hind quarters of a "*neaudh*," and returned at once for fear of disturbing the horse, as he thought it to be. The "*neaudh*" is like the *burral*, only much larger, with enormously thick horns and darkish colored hind quarters. I had a creep of some two hours, after three of them, but never got nearer than from a quarter to half a mile, and at 6 o'clock was forced to give up, with these and a herd of 20 or 30 ahead of me. I believed all along that they were large male *burral*, but Nagoo and Dhunsing, who remained behind with my telescope, swore they saw them to be "*neaudhs*" distinctly, and certainly I observed the dark hind quarters. Though I got no sport, I highly enjoyed this trip, though I suffered from the awful cold wind along the crests in returning. Horse dung (the people said of the wild animal) was abundant; as were also foot marks of the "*chunkoo*," or some other beast of prey, nearly the size of a leopard's foot print, and to the circumstance of these latter, animals being about, Nagoo and Dhunsing attributed the unusual scarcity of *burral* in this favorite resort Occasionally I saw the place where a *burral* most probably had been killed. Got back to the tents at 7h. 15m. very tired. Had some stewed and roasted *burral's* flesh for dinner. The meat brown, and by no means badly flavored, although this is the worst season. Having lived on dhall and rice since leaving Melum, I enjoyed this meat greatly; but did not sleep well after it. Face almost raw and very painful, with the hurt in my left heel becoming worse daily, I cannot give up the only opportunity I may ever have for shooting, &c. in this part of the country on account of this sore heel, so have cut away the back part of my shoes and boots, and limp along as I best may.

Bun-chour or Wild Yak.—This animal is found hereabout in the rains, and one of the Lama's people brought in to-day the horns and skull of a male, which he had killed when going down last year. The horns are short and of good thickness. Forehead unusually wide, and the horns and front part of skull, wanting the lower jaw, are a good load for a man.*

1st June.—Up at 4h. 20m. after a miserable night's rest, Ther. 31° in sleeping tent, and much the same in open air. Boiled at 188½ to 189°; started at 5h. 50m. with Nagoo and Dhunsing, on jooboos, for the crest of Bulcha ke Dhoora, or last ridge between Oonta Dhoora and the plains of Thibet. At 6h. 30m. travelling about N. E. by N. reached the top of ascent visible from Lufkhel; then turned a little more East, down the gentle descent and along level till 7h. 6m., when we reached the bed of our branch of the river, passing below Lufkhel. This is joined by numerous small streams coming down from the hills East and West, every here and there. Halted from 7h. 6m. to 7h. 15m., then along gentle ascent covered with thorn bushes "damah" and grass, till 8h. 4m., when we reached the foot of Bulcha. The spot where we arrived at the river is called Sungtah, a halting place for sheep, &c. A short distance from it, the river (or stream) divides into two small streams, one coming from about N W., the other from N. E., and our route was up the latter. The hills on either side were of inconsiderable height, bare, precipitous, and crumbling. But towards the foot of Bulcha, they opened out a little; had a few thorn bushes on the slopes; and where the surface was abraded the soil appeared of a dark brick-dust color. Does this denote volcanic action? I am told the soil is much more extensively and deeply colored at Chungnoo, and near Tirtooporee. Halted to eat biscuits and rest the jooboos from 8h. 4m. to 8h. 33m. Then commenced the ascent, (which proved far more severe than I expected,) and reached the summit at 10h. 24m., having been delayed a few minutes by one of the jooboos turning refractory.*

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* The ground I passed over this afternoon, lies on either side of our road to Doongpoo.

On the summit is a small *debta*, or heap of stones, with two or three pieces of rag tied on sticks, and to this Nagoo and Dhun Sing added a stone or two, they then salamed to the country below, and I began my questions. Instead of a plain which I had expected to see, the country is formed of alternate low hills and table lands, with a range of higher hills (well sprinkled with snow) in the distance, running N. W. to S. E. Missr is at the foot of this range, on the South face; the road from Gurtope to Tuklakote runs along the base of the same face, and it was by this route the Seikhs advanced last year. The Bulcha Pass must be fully as high as Oonta Dhoora; and although the weather was quite mild to-day, Nagoo assured me it was rarely the case, and that the wind and cold of Bulcha were more dreaded than those of Oonta. There was a thick haze Northward, and I could not therefore distinguish any thing clearly with my telescope. Chungnoo is, I believe, the only village to be seen. On the North face of Bulcha, a small stream, the Jhunkoo, rises, flowing North and a little West. This is joined by a stream coming from past Chirchun, and the two united form the Trisum river, which I could see in the distance, flowing North-westerly, a good sized river. To the Southward the peaks of Nundee Devi were visible, the larger one bearing South-west by South, also the Gertee peak S. W. Oonta Dhoora was not visible, being obscured by (I think) the Lavur hill (N.), however, I knew its direction exactly by the neighbouring peaks, and the bearing was due South. Round as far as to the West and a little North, the hills towards Mana were visible. From Bulcha it is two marches to Neetee, the intermediate halting place being Hotee.

Bearing from Bulcha.	*Name of Place.*	*No. of day's journey for laden Sheep.*
N. E. a little, N.	Chungnoo,	Three.
N. E.	Missr,	Four.

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* In the valley were a few pigeons and choughs, also the Iris plover. There was a little snow here and there; also in the hill to the East, but none on those to the West. Towards the top of the ascent was a tolerable quantity of snow, but in detached portions.

Bearing from Bulcha.	*Name of place.*	*No. of day' journey for laden Sheep.*
North.	Gurtope,	Seven. Two Gurphun, or Commissioners.
S. E by E.	Tăklakote,	Seven. A Joompun, (or Jung-pun)*
N. W. by W.	Dhapă,	Five.—A Joompun.
	Mungnung,	Six.
	Toling Mut,	Seven.
	Chuprung,	Eight.—A Joompun.
N. W. a little W. N.	Doongpoò,	Two or three.
N. E. by E.	Kyloss range,	Seven or eight.
E. perhaps a little S. (gneiss,)	Chirchun,	One. A halting place only, no village.

The view from top of Bulcha was contracted by the slope of the hill East and West just in front, and by the distant haze; no vegetation was visible, and I doubt whether on the clearest day the prospect *as one* would be worth going to look at. From Bulcha it seems as though the hills came out from Oonta Dhoora on either side in the segment of a circle, of which Bulcha is the apex ; but I doubt not they would present a similar appearance viewed from other points East and West in advance of the Conta Dhoora range (as it were); and my previously formed opinion of the Passes being over the last hills between Hindoostan and Thibet, was quite incorrect.

I descended the hill in 45m. ; 34m. more, to where I had met the river in going up; 36m. to the top of the ascent above Lufkhel; and 30m. to Lufkhel: total 2¼ hours, arriving at half-past one. I had expected to see *burral*, and perhaps the *bun-chour* during this trip, but was disappointed ; so at 3 o'clock I started off to yesterday evening's ground to look for the "*neaudhs*" and *burral* I had seen yesterday. About half-past four, I saw what with great difficulty and the aid of my telescope I made out to be a wild horse ("*cheang*"), probably "wild ass" is the more correct term. This animal seemed about 12 hands high, short and compact, and more like a mule than a horse, particularly about the tail, which with the mane and face, was black, the legs and belly white, and the sides and back a reddish brown. When feeding, the animal looked much like a small punchy native horse, but when alarmed, he drew the head up so erect, that he looked far more like a *burral* or *neaudh*, in which its color assisted. The head was rather large, and the forehead broad. This animal proved the most cunning I had ever met, though they are said to be easily approached when in herds. He never stopped in a hollow, but always trotted briskly through to the next eminence, whence he could have a clear view all round. There, if I ran or walked up quickly, he would remain till I came within 150 to 200 yards. But if I did not arrive soon, or attempted to sneak within this distance, he trotted off to another eminence, and so on. Under these circumstances, I was perpetually out of wind, always running or walking fast, and my heart throbbing as though it would burst, so that I had no hope of killing the animal. When I found it impossible to get nearer, I ventured three shots at different times, (shaken as I was, with the second sight of my rifle up) for the mere chance of hitting. My second shot was an inch or so too high, for it grazed his back, and I saw the bullet fall close behind him. He kicked up furiously with both heels, and I flattered myself, was falling; but he trotted away again, to my infinite disappointment. This went on till past sunset, when I was forced to turn homewards, not having seen any other animal during the afternoon. Reached Lufkhel at 8 o'clock, quite fatigued by upwards of 13½ hours work since morning.

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* Joompun—Magistrate and Collectors.

I would have given much for another two days at Lufkhel, but my people were averse to remaining. The Lama also was dreadfully nervous, and irritated at my having gone to Bulcha, as he verily believed I was going on into Thibet, although my servants and tents remained behind. The Lama's people were all present, but the families of some of them were in tents, only seven or eight miles below Bulcha Pass; and as the Doongpoo authorities might by chance have made a dash at me, being not above one day's riding distant, I was compelled to agree upon returning towards Melum on the morrow.

2nd June.—Started at 5h. 22m. A. M., intending to have a look at the ground where I killed the *burral* on the 31st ultimo. Had nearly two hour's fag, and saw not one *burral*, they appearing to have deserted the spot. I saw altogether five or six brace of snow pheasant, but did not attempt them, being after *burral*. Had I even done so, I doubt much if I could have got a shot, for they were excessively watchful. Feeling fatigued from yesterday's hard work, and a very bad night's rest, I mounted my jooboo, and sent the shikaree and boy before to look out; about 8 o'clock one of them returned, having seen four *burral.* I went on and saw them on a bare hill side, took a long creep to get near them, and found no trace of them when I came up. The boy had, however, seen two go up the hill, and two over the ridge to some cliffs in advance, just East of Chingoor. I therefore ascended again, over a rough landslip of hard stones to the crest of the cliff, which was formed of sheets of yellow sandstone and loose masses of the same. This stone so exactly resembled the color of the *burral,* that I saw nothing; and I was going to look further over, when my boy gave a whistle to recall me. He had seen numerous *burral* lying about ninety yards in front of me, but the whistle startled them, and the first I saw was then jumping up. I took the best shot I could at one running, and broke his hind leg well up, but did not stop him. The noise alarmed four others that were lying down a little to my right, not fifty yards off, and here another barrel would probably have ensured me a certain hit; but before I could get my double gun, one barrel of which had ball, they were a good 100 yards off, and my shot missed. The herd, consisting of from twenty to twenty-five or thirty, now slowly ascended the ridge of hill to my left, and as I had no chance of seeing them again, I took four or five long shots at them with my rifle as fast as it could be loaded. I might have killed one, as for two shots the distance was not above 200 to 250 yards; but my bullets went only very near, and I could do no damage. All search after the wounded one was ineffectual from the terrific nature of the ground, and a little blood was all the result. My shikaree quite frightened me by some of the sheets of rock he ascended and descended, until I called him away. Some two hours were lost after these *burral,* and it was 12h. 50m. before we reached the crest above (South of) Chingoor. Thence a quick descent down Kalee Mutteea Churhai to Doldunkur Nuddee by 1h. 35m., thence along the Nuddee to its junction with the Lonka, which latter being much swollen, we halted here (where the Lama was on 29th ultimo,) at 2 P. M. instead of going on to Topee Doonga, which was 18 minutes' travelling to the West, though here grass was very scarce and wood not procurable. The snow in the Nuddee had melted very much since I passed up, and

some of the snow beds were barely practicable, with no other track except under great difficulty.

The new detachment of troops gone to Ladhak is only 1,000 instead of 5,000, and they are commanded by the chief who takes credit for having annihilated Zorawur Sing last year. These troops are from Gurtope and not Lhassa, though I understand they came from Lhassa some months ago; and there are perhaps 5,000 more ready to advance from Gurtope, if this 1,000 fail. They will get a lesson probably, when Bustee Ram arrives with his Seikhs.*

3d June.—Started at 4h. 40m. after a bad night's rest, †. Ther. 42° in sleeping tent, morning very mild with dense clouds and haze. Route lay up right bank of Laukon river, and was much easier than that from Topee Doonga would have been. Ascent gentle, except the first part. Road over snow-beds and sides of landslips. At 6h. 15m. reached a small stream coming from East, which may be of considerable size at some time of the year, judging from its bed. At 7h. 26m. at the foot of Oonta Dhoora, and at 8h. 17m. reached the crest, walking up leisurely. On the Pass it was unusually mild—no wind—and haze cleared away; so that I had a good view of whatever is visible from the top. Ther. in shade 39½°. Boiled at 182°. Halted till 9h. 20m., and during the interval, I attempted a sketch of views, north and south, which I must get completed hereafter.‡ Ate a good quantity of biscuits, and drank the health of the Queen and friends.

There is a small sheet of blue water a little west of the foot of the Pass on the north side, but I believe it dries up at some period of the year. On the *debta,*§ two small sticks had been set upright. These were fringed down the south side with what I really took to be fine white cloth, but it turned out to be ice, from the congelation of moisture driven past by the bitter cold north wind. I saw one young swallow flitting about on the crest; what on earth was it doing there?

I have made a mistake I believe regarding the three hills North East of Oonta Dhoora. The nearest is Gentee, but Saour is Eastward of that again, and the name of the second I do not know, (unless it be "Lusher.") Chingoor may be the name of the third, or merely of the ridge above Chingoor. Commenced the descent at 9h. 20m., reached foot at 9h. 55m.; Doong at 12h. 15m., breakfasting place of 28th ultimo 2h. 30m., halted till 3h. 15m., and then on to Melum, where I arrived at 5h. 40m., quite exhausted by the 13 hours' travelling. At the foot of the Pass, the snow was melting rapidly, and large fissures were forming, snow very soft, sun unpleasantly hot. Goonka river much swollen since I passed up, and the snow-bed, by which we crossed to Melum side falling in rapidly. My face and heel were exquisitely painful, and I was delighted to get back to Melum for my bed. The price of a yak is from eight to twelve rupees; they carry less than a jooboo, and sometimes turn upon their drivers, or rush down hill when urged beyond their patience; a jooboo never does this, carries 1½ to 2 maunds well, lives to 30 years or so, and works 12 to 14 years. Dhan Sing is my authority. In descending the Pass yesterday, I heard the fall of an avalanche somewhere in the vicinity; the noise was that of a loud and continued peal of thunder; the Bhooteas have stories of men and goats being lost in snow storms and avalanches. One I heard to-day was of 4 men with 500 sheep and goats lost during a snow storm of 7 days near Sungon. Three men escaped back to Melum, and the tribe of Bhooteas who suffered this heavy loss forswore the Thibetan traffic for ever. Now-a-days, people seem to have become acquainted with the seasons and weather; for accidents very rarely occur.*

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* By last account, the Chinese Thibetan forces had been totally routed at Ladhak by the Seikhs, October 14, 1842.—J. H. B.

† Probably the rarity of the air may have had a greater effect on our traveller than (in his note on Manson's Journal) he seems inclined to admit.—J. H. B.

‡ See Plate.

§ Hillock or heap of stones for offerings and worship.

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* A short time after Lieut. Weller's departure from the Bhote Mahals, I received an official report of two Bhooteas with 8 or 10 loaded jooboos and some sheep being lost in a snow storm. Accidents of this kind are most frequent during the months of May and October; in the former month from the fall of avalanches, both of snow and rocks occurring in the middle of the day when the sun becomes powerful, and the masses on the peaks become loosened, in the latter month from the first falls of new snow at the commencement of the winter surprising parties who attempt for the sake of profit to prolong the season of traffic across the Passes. In October 1837, the Netee Pass was quite open on the 11th, on the 12th it was entirely closed by a sudden snow storm of which I was an eye-witness. The village of Macca near Budrinath has been twice carried away by avalanches since 1815, and the pilgrims who venture to Keddernath too early in the month of May, are sometimes surprised by avalanches falling in the three miles between Gowree Koond and the temple; the only signs of them left being sticks and shoes scattered about the snow. Common caution as to choice of season would save all such accidents to the pilgrims; indeed, accidents are yearly becoming of rarer occurrence.—J. H. B.

A perpetual Moon Table, By Capt. Robt. Shortrede, *1st Assist. G. T. S.; F. R. A. S. &c. With plates.*

I now send an account of a Table, which I have constructed for finding the Moon's age for any date, past or future, somewhat similar to that lately published for finding the week days.

If the Moon's course were completed in an even number of days, and with a uniform motion, its age and the time of any particular phase would be found as readily and surely as the day of the week; but as neither of these conditions holds good, and as two lunations are scarcely ever completed in equal times, if we wish to be correct, we must either make a calculation at length, or avail ourselves of those already made, or else use some other method by which correctness is made to give way to convenience.

The rule commonly given in books of Astronomy for finding the Moon's age is by no means very simple, as it requires us first to know the Golden Number and the Epact. The rule for finding the Golden Number is tolerably simple, as also is that for the Epact at present, but for this, after 1900, a new rule is necessary, which as given in Barlow's Dictionary, runs thus: 'Divide the centuries of the given year by 4, multiply the remainder by 17; then to this product add 43 times the quotient, and also the number 86, and divide the whole sum by 25, reserving the quotient: next multiply the Golden Number by 11, and from the product subtract the reserved quotient, so shall the remainder after rejecting all the 30's contained in it, be the Epact sought.' This rule is such that few persons will be inclined to use it, except in cases of urgent necessity, and even by means of it the Moon's age may fall on the wrong day, as no account is taken of the great Equations depending on excentricity, which may amount at a maximum to 14 hours on either side of the mean time given by the Tables.

The Table now given shews at once, without calculation, and with scarcely any trouble, the mean times of New and Full Moon, &c., as also the Moon's age to the nearest day, and by means of another similar card for the two principal corrections, the true times of New and Full Moon may be found within an hour or so of the results, which would be found by a detailed calculation.

In constructing this Table, I have used methods of approximation more or less exact, according to the exigency of the case, so as to retain as much correctness as is consistent with convenience, and also to allow of the admitted errors being corrected in the least troublesome way I could devise.

A mean lunation consists of 29d. 12h. 44m. 03s.* If this be supposed to occupy the circumference of a circle, it will, when divided into days, have 29 parts each equal to a day, and a space corresponding to 44m. 03s. more than half a day. It will, however, be vastly more convenient to divide the circumference into 29½ equal parts, each of which will correspond to 89.593s. or about 1m. 30s. more than a day, but in ordinary cases of finding the Moon's age, or time of New Moon, &c. the small quantity by which the subdivisions exceed the exact value of a day, may be disregarded without inconvenience.

The days of the month are written in order from right to left on the inner card, which of course contains 29½ divisions, corresponding to those of the lunation ; the days beyond 29 being written intermediately to those at the beginning of the month.

As January contains 31 days, or nearly 1½ day more than a lunation, the next month February is written to the left of January by a corresponding quantity. February having only 28 days, falls short of a lunation by nearly 1½ day, and hence March is written to the right of February, and would fall exactly under January if the lunation contained exactly 29½ days. In like manner April falls nearly under February ; and May near half a day to the left of April ; and so on, each month falling to the left by a quantity corresponding to the Epact of the preceding month. If the lunation contained exactly 29½ days, December would fall 9½ days to the left of January, but this must be diminished by 11 times, 44m. 03s. = 8h. 04m. 33s., leaving 9d. 3h. 55m. 27s., and if this be estimated by the scale of the Table, it should be farther diminished at the rate of 89.50s. daily, which amounts to 13m. 40s., giving a result of 9d. 3h. 41m. 47s. It would simplify the apportionment of this difference, without giving rise to sensible error on this scale to reckon it at 45m. 1-16th of half a day on each month. The exact position of the month marks, are in half days as in the following Table :—

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* In most modern works the lunation is stated at 29d. 12h. 44m. 02 8s. This number is given under *Moon* in Barlow's Dictionary, while on the opposite page a *lunar month or lunation* is stated at 29d. 12h. 44m. 03s. 11t. This latter quantity agrees best with the ancient observations, and the former quantity with the modern. The quantity here used is pretty nearly the mean of the two, and is that usually given in common works. The difference of 2-10th of a second on each lunation amounts in 4000 years to about 2h 14m. 51s., and therefore in a Table like the present, scarcely requires farther notice

January,	0·00 2·00	May, . . .	55·2	September,	45·63
February,	56·09 58·09	June. . .	52·3	October, . .	44·70
March, . .	00·12	July, . . .	51·45	November,	44·79
April, ...	56·21	August .	48·51	December,	40·86

The outer card contains the years of a century in their order, from left to right, at intervals, corresponding to the Annual Epacts.

A tropical year consists of 365d. 5h. 48m. 51s.* nearly, and in 12 lunations there are 354d. 8h. 48m. 36s., the difference between which is 10d. 21h. 00m. 15s., which may be called the tropical Epact. If the Calendar were kept in tropical years, this would be the constant annual Epact; but in order to correspond with the Calendar years, this tropical Epact should be diminished by 6h. for 3 years, and in the 4th year should have a day more than in the three preceding. They would then consist of 10d. 15h. 00m. 15s. and 11d. 15h. 00m. 15s. respectively. To reduce these Epacts to the scale of lunation days, they must be diminished at the rate of 89s., 50 daily, or 15m. 40.93s. and 17m. 10.44s. or 15m. 58.33s. at an average: these become thus 10d. 14h. 44m. 34s. and 11d. 14h. 43m. 04.5s. These would be the quantities by which the years on the outer card advance to the right of those preceding them, if it were true that a day is gained in every 4 years; but the error on this supposition reduces the average correction as above to about 4m. 50s. on each year.

The following considerations will, however, somewhat simplify the mode of writing the years in their order. In 1236 lunations, there are 36,499 days, 19h. 25m. 48s., in a Gregorian Century there are 36,524 days; being in excess of the lunations by 24d. 4h. 34m. 12s. This may be called the Gregorian century Epact. If the years of the century be written out on the card at intervals of 10d. 15h. and 11d. 15h. a Gregorian Century will consist of 1236 lunations, 24 days and 12 hours. In order to compare these results, the 24d. 12h. must be increased at the rate of 89.593s, daily, or the 24d. 4h. 34m. 12s. must be decreased at the rate of 89.500 daily, to have them in common or lunation days respectively. The latter will be the more convenient, as the adjustment is to be made on the card which has lunation days; the correction to be subtracted from 24d. 4h. 34m. 12s. is 36m. 05s. which leaves 24d. 3h. 58m. 07s. as the Gregorian Century Epact, on days of 29½ to a lunation, the difference between which and the 24d. 12h. given by the card or 8h. 01m. 53s. is the error generated in a Gregorian Century by using the Epacts 10d. 15h. and 11d. 15h. Now this quantity is as nearly as may be ⅔ or 67 p. c. of half a day, and being distributed over the whole century, becomes ⅔ p. c. of half a day for each year. The odd 15h. of the Epact is half a day, and ¼ or 25 p. c. of half a day. Hence counting by the 59 half days, and beginning at 00 the year, 01 will stand at 21.25—⅔=21.24 to the right of zero: the year 02 at 2 (21.25-⅔)=42.49 and the year 03 at 3 (21.25⅔)=63.73=4.73 after rejecting 59 or a whole circumference. In this manner the following Table was made:—

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* This quantity is given with some variation by different Astronomers. The above is the value towards which Delambre seemed to incline. The difference of a second or two is of no importance as regards the Table.

TABLE I.

Year	Place on the Card.	Year.	Place on the Card.	Year	Place on the Card	Year	Place on the Card	Year	Place on the Card	Year	Place on the Card.
00 {	57 00	19	57 62	38	58 25	57	58.87	76	0 49	96 {	20 36
	00 00			39	20 4'	58	21 11	77	21 74		22.36
01	21 24	20	21 87			59	12 36	78	42.98	97	43 60
02	42.49	21	43 11	40	13.75			79	5 22	98	5 85
03	4.73	22	5.35	41	5.98	60	6.60			99	27.09
		23	26 60	42	27 22	61	27.84	80	28.47	100	{ 48.33
04	27 97			43	48.40	62	49 09	81	49.73		50
05	19 21	24	19 81			63	11 33	82	11 93		
06	11.16	25	12 08	44	12.71			83	33.20		
07	32 70	26	33 33	45	33.95	64	31 57				
08		27	54 57	46	55.19	65	55 81	84	56 44		
	55.95			47	17 41	66	18 06	85	18 68		
09	18 19	28	18 81			67	39 30	86	39 93		
10	39 13	29	40 06	48	40-68			87	2.17		
11	1 68	30	2 30	49	2.92	68	3 55				
		31	23 54	50	24.17	69	24.79	88	25 41		
12	21 92			51	45.41	70	46.03	89	46 66		
13	46 16	32	46 79			71	8.28	90	8 90		
14	8 11	33	9.03	52	9.65			91	30.14		
15	29.65	34	30.27	53	30.90	72	31.52				
		35	51 52	54	52 14	73	52 76	92	53.39		
16	52 89			55	11 38	74	15 01	93	15.63		
17	15 11	36	15 76	56 {	35.63	75	36.25	94	36 87		
18	36.38	37	37 00		37 63	76	57 49	95	58 11		

The years being written in their places shew very plainly the Metonic Cycle of 19 and the Calippian of 76 years. That of Meton is well known as the Golden Number.

Cycles of 11, 8, and 3 years may also be observed, and the order of their succession is worthy of being kept in mind as helping to find readily the place of any required year on the card.

A little practice will shew the value of this remark, and besides it, no other seems necessary

The middle card has on its inner circle the days of the Moon's age, and the known characters for New and Full Moon, and for First and Last Quarters; on the outer circles are the full centuries of Old and New style. The manner of writing the days of the Moon's age is obvious enough, and requires no explanation. That of writing the full centuries is now to be shewn.

The Gregorian Century Epact being 24d. 4h. 34m. 12s., the Julian Epact is 25d. 4h. 34m. 12s., and by intervals corresponding to these times will these centuries follow each other towards the right. But as these quantities are much greater than half a lunation, they may be subtracted from 29d. 12h. 44m. 03s., and the remainders 5d. 8h. 09m. 51s. and 4d. 8h. 09.51s. will be the intervals of the successive centuries towards the left. These being in common time are to be reduced to that of the card at the rate at 89.50s. daily, as formerly shewn, when they become 5d. 8h. 01m. 53s. and 4d. 8h. 03m. 22.5s. respectively. If these be taken at 5d. 8h. and 4d. 8h. by neglecting the small excess the error in 400 years will be 9m. 01.7s. and in 4000 years only 1h. 30m 27s. For the last 4000 years this error would be rather convenient than otherwise, as tending to neutralize that arising from neglecting the acceleration, which for the same period, as already stated, would be about 2h. 41m. 54s. the difference between which and the quantity now omitted being 1h. 14m. 27s.*

New style centuries may be carried forward at the same rates of 5d. 8h. and 4d. 8h. as far as we please, (though *in point of fact* they are not required before the full century 15); as in the following Table, to which if thought necessary may be applied corrections for the error 0031 here admitted, as also for the acceleration.

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* It is hardly necessary to remark, that we have no recorded observations so far back as 4000 years, and that many of the earliest recorded are uncertain to half an hour or more. The Table may therefore be depended on farther back than is likely ever to be required

TABLE II.

Cent.	N. S.	O. S.	B. C. or —
0	17 29	13.29	13 29
1	6 62	4 62	21.96
2	51 96	51.96	30 62
3	41 29	46.29	39 29
4	35 62	37.62	47.96
5	21.96	28.96	56 62
6	14 29	20 29	6 29
7	5 62	11.62	14 96
8	53.96	2.96	23.62
9	43.29	53 29	32.29
10	32 62	41.62	40 96
11	21 96	35 96	49 62
12	13.29	27 29	53.29
13	2 62	18.62	7 96
14	50 96	9 96	16.62
15	40 29	1 29	25.29
16	31.62	51.62	33 96
17	20 96	42.96	42 62
18	10.29	34.29	51 29
19	58 62	25.62	0 96
20	49.96	16.96	9 62
21	39 29	8 29	18 29
22	28 62	58.62	26.96
23	17.96	49 96	35 62
24	9.29	41 29	41 29
25	57.62	32.62	52.96
26	46 96	23 96	2.62
27	36.29	15 29	11 29
28	27.62	6.62	19 96
29	16 96	56.96	28 62
30	6.29	48.29	37.29
31	54.82	39.62	45.96
32	45.96	30 96	51 62
33	35 29	22 29	4 29
34	24 62	13 62	12.96
35	13.96	4 96	21.62
36	5.29	55 29	30 29
37	53.62	46 62	38.96
38	12 96	37.96	47.62
39	32 29	29 29	56 29
40	21.62	20 62	5 96
41	10.96	11.96	14.62
42	0.29	3.29	23.29
43	48.62	53.62	31.96
44	39.96	41 96	10 62
45	29.29	36.29	49.29
46	18 62	27.62	57.96
47	7.96	18 96	7 62
48	58 29	10 29	16 29
49	47 62	1 62	21.96
50	36 96	51.96	33.62

This table requires but little explanation. The first column shews full centuries. That marked N. S. shews the place in half days on the circumference of the card, of the mark for adjusting the N. S. centuries to the mark of ● ● on the outer card. In like manner the columns headed O. S. and B. C. or — shew the places of the marks for adjusting the cards by, in centuries of O. S., or in those before the Christian era.

These observations may suffice for shewing the general construction of this card; the reason for giving the century marks their particular position remains to be stated.

According to the Synopsis of Astronomy in Barlow's Tables, (which, and his Dictionary, were the only books of reference within my reach when arranging this Table) the Moon's mean longitude on the 1st of Jan. 1801, was 3s. 21° 36′ 42″, or 111° 36′ 42″ that of the sun being 9 10 09. 13, or 280 09 13

Hence the moon was then distant from the sun. } 191 27 29

or 11° 27′ 29″ past the full. This at the rate of 29½ days to a lunation, gives the Moon's age on the 1st of January 1801 as 15° 66′ 11″. Barlow's data being taken from Laplace's Systeme du Monde, are probably adapted to the meridian of Paris. The difference between Paris and Greenwich is 9m. 21.5s. corresponding in lunation days to .00643. Greenwich being to the west of Paris, this must be added to 15° 66′ 11″, in order to have the Moon's mean age at Greenwich on 1st January 1801. As for the convenience of keeping the same digits throughout a century, I reckon from 1800, the Epact for a year of 365 days must be deducted; this is 10d. 15h. 11m. 24s. which reduced at the rate of 89.50s. daily, becomes 10d. 14h. 55m. 33s. = 10d. 5219, and this taken from 15d. 66 11 + 00643, leaves 5d. 14 56 as the Moon's mean age in lunation days at Greenwich on the 1st January of 1800. In half days this is 10·29, as in the Table.

It is not distinctly stated by Barlow, whether the era given by him begins at noon or midnight, but as the French Astronomers about that time attempted to introduce civil reckoning, and as the supposition of this appears to agree pretty well with some old Tables, like Ferguson's, which I have lately got hold of, I adopt it. subject to any correction which better authority may hereafter shew to be requisite.

Generally the marks on the card are put on the left of the numbers to which they belong. On the outer card Leap years have two marks, that beside which the number is written answering for the months from March onwards, and the other answering for January and February.

The use of this Table is very much like that of the Table for week days. The full century mark on the middle card is to be set to that of the ● ● on the outer. The given month-mark on the inner card is then to be brought into line with the mark of the current year on the outer: when opposite the days of the month will be seen those of the Moon's age. Opposite ● will be the day of New, and opposite ○ the day of full Moon; and opposite ☽ and ☾ the days of the first and last quarters.

The times thus found are of course the mean civil times at Greenwich; but there is no difficulty in reading the Table in astronomical time, as any person will perceive.

In order that the Table may serve for dates before the Christian era, it is to be observed that the year 1 B. C. may be considered as the year 0 of the Christian era, or the hundredth of the century — 1. Hence this rule. Add 1 to the given century B. C. and reckon it —; then to the complement to 100 of the odd year add 1 and reckon that as the current year of the century. In this way the year 721 B. C. is the 80th of the century—8; and may conveniently be written $\bar{8}$ 80, the mark — applying to the full century only, like the negative index of a logarithm.

Robert Shortrede.

November, 1841.

The present Table in conjunction with the one for week days will give Easter for ever with less trouble than by any other method at present known. All that need be done is, to set the Table to March in any given year, and if Full Moon falls after the 21st, find by the other Table the corresponding week day; the first Sunday after Easter. If full Moon in March falls before the 21st, set the Table to April, and proceed as before.

Professor Gauss has given a formula for finding Easter without using the Epact, as may be seen in Delambre's Astronomy. It is as follows:—

Divide the given number of the year by 19, and let a be the remainder.

Divide the given number by 4, and let b be the remainder.

Divide the number by 7, and let c be the remainder.

Divide $(19a + M)$ by 30, and let d be the remainder.

Divide $(2b + 4c + 6d + N)$ by 7, and let e be the remainder.

Then Easter-day will be the $(22 + d + e)$ of March or the $(d + e - 9)$ of April. For the Julian Calendar, this rule is general, where $M = 15$ and $N = 6$ always, it requires a correction for the Gregorian Calendar. If the calculation gives the 25th or 26th of April, take away seven days.

The following Table gives M and N in the Gregorian Calendar as far as 2,500.

		M	N
From 1582	to 1699	22	3
1700	1799	23	3
1800	1899	23	4
1900	1999	24	5
2000	2099	24	5
2100	2199	24	6
2200	2299	25	0
2300	2399	26	1
2400	2499	25	1

On the Treatment of Geometry as a branch of Analysis. By S. G. Tollemache Heatly, Esq.

1. The clothing of purely geometric principles in analytical language—in other words—the conduct of elementary geometric inquiries by functional equations is historically connected with the subject of my former papers. Legendre's endeavour to prove on functional principles, that the three angles of a triangle are equal to two right angles, and thence to deduce the theory of parallels will readily occur to the memory of those familiar with mathematical records. But the first step in developing the idea may be traced higher, and I think successfully, to a yet more illustrious origin.

2. In the 2nd volume of the Memoirs of Turin, there is a demonstration, purporting to be by M. Daviet de Foncenex, of the parallelogram of forces. Assuming two forces, each equal to a, acting at an angle θ and denoting their resultant by z, he states z to be a determinate function of a and θ, and that this expression must by the principle of homogeneity be of the form

$$z = a f(\theta)$$

It follows from thence, that the angle θ remaining constant, z is always proportional to a. "On pourrait," continues the author, "de meme demontrer par cette methode d'une maniere directe et fort naturelle plusieurs theoremes sur la proportionalité des cotés des figures et un grand nombre d'autres propositions de geometrie et de mecanique."

This essay, I have said, bears the name of Foncenex, but I am induced to attribute it to Lagrange, on the foundation of some curious facts revealed by Delambre in his eloge on that mathematician, (Annals of Philosophy, vol. III). It is there stated that Foncenex received the analytical part of his memoirs from Lagrange, and only performed the task of developing the reasoning on which the formulas depend.[*] Parts of this very memoir were afterwards reclaimed and re-written by Lagrange, and the beauty and boldness of the portion we are considering, betray I think undeniable traces of being *ex ungue leonem*, even without the collateral evidence. The conclusion of this historiette is amusing. In recompense for the science displayed in these identical memoirs, Foncenex was appointed Minister of Marine by the Sardinian monarch, an honour which separated him from Lagrange, and he ceased in a short time to take interest in mathematical pursuits. Too simple minded to discern between cause and effect, Montucla laments the unaccountable apathy which Foncenex thenceforward displayed towards researches which had given him profit, and might have added honour. Certain it is, the Minister died and made no sign anent the "plusieurs theoremes de geometrie et de mecanique."

The essay, which we may therefore attribute to Lagrange, is quoted by Legendre at the foot of his celebrated second note, as doing for mechanics what he had done for geometry. And when we take further into account, the long and early intimacy between the two analysts, (Legendre having edited the first edition of the Mecanique Analytique), it becomes highly probable that Lagrange was the first who conceived the idea of condensing the scattered truths of geometry into a few families of formulæ, as he did those of mechanics: and that Legendre caught the spirit of such peculiar reasoning from his friend, his own original genius enabling him to apply it with the success he did.

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[*] This, by the way, is the manner in which Göthe is said to have accounted for the fertility and variety of Scott's pen. Sir Walter was supposed to have sketched the plot and skeletoned the chief characters, the whole being then worked up by younger artists at the foot of this Gamaliel! A delicious theory on fertility and variety by one of the most fertile and varied intellects of the age!

3. Legendre's mode of procedure may be put in the following manner. If from the ends of a given base we draw two straight lines making given angles with that base, we have performed definite operations giving a single fixed result. If this result prove to be a triangle, then the triangle being sole and invariable, its elements must all be determinable by calculations founded on the data which produce that invariability; viz. the base and the base angles. Both the data and the quæsita can only appear in these calculations in the shape of numbers, and therefore either as ratios *inter se*, or ratios involving some constant unit of measurement. Now the angles have such a constant unit in the right angle, but the sides have not, there being no natural unit of linearity. The consequence will be, that the sides can only appear in the calculations as ratios *inter se*, but the angles may appear either as ratios *inter se*, or as fractions of a right angle. Now among the elements of the triangle which are determined by the base and base angles is the third angle, it will follow therefore that there is some form of calculation connecting this third with the data. But of these four the angles easily enter the calculation, while we do not see how the side can, since there is no other line necessarily involved in the matter. We conclude therefore that the side cannot enter, and therefore that the third angle is determinable only by help of the other two. Hence, whenever two angles in each of two triangles are identical, each to each, the third angles are also identical.

The sequel of this demonstration is geometrical. By dropping a perpendicular on the hypothenuse from the right angle, we divide a right angled triangle into two others, each of which has two angles equal to two of the primitive triangle. They are consequently equiangular to the primitive triangle and to each other, whence it is seen, that the two acute angles of the large triangle are together equal to the right angle, and hence all three to two right angles. The proof is then extended to triangles in general, by dividing them into right angled triangles.

4. The publication of this train of reasoning excited a discussion unprecedented in the cold calm regions of science, and one which assumed a character of acrimony, that can only be accounted for by the political antipathies which extended even to the schools of mathematics. Ivory, Leslie, Playfair, Brewster, Maurice, Nieuport, and the great author himself, took prominent parts in the controversy. It is not my intention to raise, or lay the ghosts of departed objections. Stated in the manner I have done, divested of the appalling formalities of a functional investigation, there are only two points in Legendre's proof over which the reader will pause for an instant.

The first is, why will geometric determination afford any grounds for numerical calculation? This is easily answered. The remaining elements being geometrically given, their proportions to the data are given, that is, a series of numbers being assumed for these last, a series of numbers for the rest are found. Hence the necessity of supposing a numerical process connecting the consequent numbers with the assumed ones.

The second is of a graver character. It is suggested at the place where, having settled that the calculation of the third angle involves only the magnitudes of the other two, we conclude that two triangles, having two angles equal each to each, will also have the third angles equal. This conclusion is evidently founded on the assumption that there is an invariable formula of calculation for *all* triangles, connecting the third angle with the other two. The question is, having assured ourselves that the triangle ABC has a formula connecting the angle C with A and B, what grounds have we to suppose that the *same formula* will be applicable to A′B′C′? The fairest mode of meeting the query I conceive to be this. When a base is laid down and lines are drawn making given angles with it, we perceive intuitively that the system is fixed. The magnitude of the base and base angles is not a constituent of this fixity. They may vary, but the conception of *determination* remains not the less distinct. To express this *fact* analytically, we must say that the magnitudes in the triangular system vary *inter se*, but the laws which connect their respective variations are invariable and universal. Hence we conclude that every geometrical figure has its peculiar but invariable formula of calculation. The geometrical definition prescribes an invariability of form as regards *figure:* when we transfer the question into the domains of analysis, we introduce a consideration equivalent to this, it is the invariability of form as regards *calculation.*

Legendre's own attempt to clear up this point is not even specious, although while his impregnable positions were hotly attacked, the weakest escaped all but the practised eye of Sir James Ivory. He had to prove that the formula by which the third angle is calculated from the base and base-angles applies to all triangles. He imagines two triangles, one constructed with the data a, B, C, and another with a', B, C, having if possible different formula, the first say ϕ, the second ϕ'. Then considering a' to vary to a, he obtains a third triangle. But this third triangle has the same data as the first, and its third angle is therefore equal to that of the first. Hence it must be calculated by the same formula. *But the formula of the third is that of the second,* that is ϕ', hence ϕ & ϕ' are the same formula. The words in italics beg the question glaringly: if the variation of an element can make a formula vary (which is to be disproved,) then the change of a' into a gives the third triangle some new formula more or less different from ϕ': the principle of superposition shews that it is identical with ϕ, hence ϕ differs from ϕ', and there is no absurdity forced upon the adversary.

5. The geometrical weight of this flaw is of importance and great interest. It was pointed out by Sir J. Ivory, that to assume a' to change to a while the base angles remain B and C as before, is equivalent to drawing from the ends of a base a, lines making with it angles equal to those of a given triangle A′ B C. To assume further that the formula of A′ B C will apply to the new figure is to assume, that the new lines will form a triangle with the new base a. The double assumption amounts therefore to stating, that two lines making given angles with a third will always meet, the only thing known regarding those given angles being that they are less than two right angles; since they are angles of a given triangle. This is nothing more nor less than Euclid's axiom, and therefore Legendre's process involves the assumption of that axiom. The analytical investigation therefore rests on an assumption, that of the *invariability of formula* as distinguishing a defined geometrical figure, which no skill can do away

with, and which must either be the subject of postulate, axiom or demonstration.

6. To his striking presentation of the 32d Prop. Legendre added the "plusieurs theoremes sur la proportionalité des côtés des figures," yet notwithstanding the intense interest excited by the publication, the violent discussions to which it gave rise, and the eminent individuals who enlisted themselves on one or other side, it has often appeared to me singular, that no attempt should have been made to develope the whole system of elementary geometry in a concinnous form on the same principles.* Independent of its utility as an introduction to the methods of analysis, the young mathematician would be benefited by seeing grouped together those truths which are nearest related in affinity: he would, in the language of Decandolle, have those nearest in books which are nearest in the order of nature.

7. The only principle on which it would be necessary to base such an attempt would be this: that every defined geometrical figure is the representation of certain invariable formulæ of calculation, the numbers involved in such calculations being represented by the ratios of sides, angles, areas, and the other concomitants of the figure, either *inter se*, or to any homogeneous natural constants that may exist.

8. A triangle then considered analytically will represent a set of formulæ expressing the relation between its sides and angles. If according to the usual notation these be *a*, *b*, *c*, A, B, C, we have

$$F\left\{a, b, c, A, B, C, K\right\} = 0$$

The letter K, introduced into the formula, stands for the constants which may be furnished by nature. There are, however, no linear constants, but there is an angular one—the right angle; it follows therefore that K can only be a function of the right angle. When therefore the formula assumes a numerical shape, it must be written

$$F\left\{\frac{a}{b}, \frac{a}{c}, \frac{A}{K}, \frac{B}{K}, \frac{C}{K}\right\} = 0$$

These are all the ratios necessary to be taken into account as $\frac{b}{c}$ is $\frac{a}{c} \div \frac{a}{b}$ and $\frac{A}{B} = \frac{A}{K} \div \frac{B}{K}$; &c.

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* While this has been passing through the press, I have met with in Lacroix an allusion to "M. Corancez qui dans un Memoire fondé sur des principes analogues est parvenu aux theoremes les plus importans de la Geometrie Elementaire."

9. The next step is to inquire whether the expression does not admit of modification, or whether it is essential to the determination of the triangle that five at least of its elements should be given. A short process of deduction informs us, that from the data a, B, C, not more than a single triangle can be constructed, and that therefore those three elements are sufficient for the *complete* determination of all the rest. But it will be quite unwarrantable to say, that even these three are absolutely necessary (every one of them) to calculate any given one of the elements. In calculating A it is at once evident, that two will be quite enough. For the b and c being settled to be foreign to the computation the ratios $\frac{a}{b}$ and $\frac{a}{c}$ cannot enter, and therefore a itself is foreign. Hence the computation of C depends exclusively on A and B; or

$$C = F\left\{A,\ B,\ K\right\}$$

Recurring now to the artifice of Legendre or Leslie, it is easy to prove $A + B + C = \pi$. This truth embodies Euclid I. 32, 16, 17.

If there be another triangle A′BC on the same base BC and enveloping ABC; the angles $A'BC + A'CB \; 7 \; B + C$, hence $A' \angle A$ (Euclid I. 21). If A then move away from BC, the angle A diminishes and $B + C$ increases. When $A = 0$, the lines b and c do not meet, that is, they become parallel; at this moment then $B + C = \pi$. Hence parallels cut by a third straight line have the interior angles equal to two right angles. The converse is also true since if $B + C = \pi$ the angle A made by b and c must be zero, whence those lines are parallels. (Euclid I. 27, 28, 29, 30.)

10. I now proceed to determine the form of the functional equation representing a triangle. Take a triangle right angled at C, then since it is determinable by the data A, B, c, we can calculate a and b by the help of c, A, B. But C being right, A is calculable from B directly, therefore each side is calculable by the hypothenuse and one of the angles. The formula will therefore contain the ratio of the two lines and the ratio of the angle. Write it thus:—

$$\frac{a}{c} = \phi(A) \quad \text{and} \quad \frac{b}{c} = \psi(A)$$

But the relation of a to its opposite angle A is *symmetrical* with that of b to B, ∴

$$\frac{a}{c} = \psi(B) \text{ and } \frac{b}{c} = \phi(B)$$

Calling the functions ϕ and ψ by the names *sin* and *cos*, we have

$$a = c \cos B = c \sin A, \text{ and } b = c \cos A = c \sin B.$$

These considerations premised, it is easy to determine the general form of the functional equation for any triangle ABC. Drop a perpendicular from A on a, then a will be divided into two parts, the one adjacent to the angle B must as above be equal to $c \cos B$, and the other, adjacent to the angle C must also be $b \cos C$. Hence

$$a = b \cos C + c \cos B.$$

Besides, the perpendicular in the one triangle equals $b \sin C$, in the other it is $c \sin B$; these are therefore equal or

$$b \sin C - c \sin B = 0$$

The conditions of symmetry give us two other pairs of equations.

$$\left.\begin{array}{l} a = b \cos C + c \cos B \\ b = a \cos C + c \cos A \\ c = a \cos B + b \cos A \end{array}\right\} \ldots(\alpha) \qquad \left.\begin{array}{l} b \sin C - c \sin B = 0 \\ a \sin C - c \sin A = 0 \\ a \sin B - b \sin A = 0 \end{array}\right\} \ldots(\beta)$$

11. We must remember, however, that the functions sin and cos are only intelligible with regard to acute angles, since from the consideration of such only they were derived in (10). The formulæ above apply therefore only to acute angled triangles, unless we are able to put such an interpretation on sin and cos in the case of right and obtuse angles, as will permit us to consider (α) and (β) universal forms.

If (α) and (β) are to apply to all triangles, then if C were a right angle we should have

$$b = a \cos \left(\frac{\pi}{2}\right) + c \cos A \text{ and } a \sin \left(\frac{\pi}{2}\right) - c \sin A = 0$$

But examining a triangle right angled at C, we perceive as in (10),

$$b = c \cos A \text{ and } a - c \sin A = 0.$$

Hence to admit the generality of (α) and (β) we must interpret

$$\cos \left(\frac{\pi}{2}\right) \text{ as } 0 \text{ and } \sin \left(\frac{\pi}{2}\right) \text{ as } 1.$$

If the triangle again were obtuse at C, the perpendicular from A would fall on a produced, hence a would be the difference of $c \cos B$ and $b \cos (\pi - C)$ or $a = c \cos B - b \cos (\pi - C)$. The perpendicular is also in one case $c \sin B$, in another $b \sin (\pi - C)$; or

$$c \sin B - b \sin (\pi - C) = 0$$

Compare these with (α) and (β) supposed to be universal, and it must follow that

$$\cos C = -\cos (\pi - C) \text{ and } \sin C = \sin (\pi - C)$$

are the only interpretations that can be put on the sin and cos of the obtuse angle C. We are now in a position to consider (α) and (β) universal.

A little further study of the angular functions will contribute to subsequent condensation. In the triangle right angled at C, we have $a = c \sin A$ and $b = c \cos A$, dividing one by the other

$$\frac{a}{b} = \frac{\sin A}{\cos A} = \text{a function of } A\text{; specify it as } \tan A$$

$\therefore a = b \tan A$. Now b remaining the same, by inspection a will increase as A increases, therefore tan A increases with A. This will make sin A increase with A. For cos A (being sin B) is related to B as sin A to A. When A increases, B diminishes; if then sin A did not increase, cos A would not decrease, and tan A their quotient would not increase. This as relates to acute angles; with regard to obtuse ones $\pi - A$ decreases as A increases, hence the sin will decrease positively, and the cos increase negatively, the tan of course increasing negatively.

Table of change with angle increasing.

Angle.	Sin.	Cos.	Tan.
acute	+ increase.	+ decrease.	+ increase.
right	1	0	$+ \infty$
obtuse	+ decrease.	— increase.	— decrease.

It will follow therefore as the sin is a function increasing continuously from 0 to 1, and then decreasing continuously from 1 to 0, as the angle increases continuously from 0 to π, that any given value of sin will be found in two parts of this course on either side of the maximum 1 and thus belongs to two angles A and $\pi - A$; whence there is an ambiguity in determining the angle from the sin, unless there is something to tell us whether it is obtuse or acute. Also if sin B be less than sin A, B may be an angle less than the angle A; but if A be an acute angle, B may also be an angle greater than the obtuse $\pi - A$. The latter case, however, can never occur when B and A belong to the same triangle, since $B + A$ are always $< \pi$ and $\therefore B < \pi - A$. In a triangle therefore if $\sin A > \sin B$; $A > B$, and vice versâ.

With the cos there is no ambiguity, the sign + or — immediately determines whether the angle is acute or obtuse. If we have

$$\cos A = \cos B,\ A = B;\ \text{if } \cos A > \cos B,\ A < B.$$

12. We are now in a condition to discuss the geometrical properties *implicated* in equations (α) and (β). The first set can be presented in a more convenient form by eliminating cos B and cos C from the first by the help of the second and third.

It then becomes

$$\left.\begin{array}{rl} & a^2 = b^2 + c^2 - 2\,b\,c \cos A \\ \text{symmetrically} & b^2 = a^2 + c^2 - 2\,a\,c \cos B \\ \text{and} & c^2 = a^2 + b_2 - 2\,a\,b \cos C \end{array}\right\} \quad \ldots\ldots (\gamma)$$

On these two sets of equations, β dependent on the sinal and γ on the cosinal forms of the functions, the entire geometry of triangles can be raised with little more difficulty than is experienced in the deduction of a corollary.

Taking the first equation of β, it can be changed to the proportion $b : c = \sin B : \sin C$.* Hence if $b = c$; $\sin B = \sin C$. It will follow that $B = C$ (I. 5) for the ambiguity $B = \pi - C$ cannot take place, since two angles of a triangle cannot both be obtuse. Similarly, if $B = C$; $b = c$ (I. 6). If $b\ 7\ c$, $\sin B\ 7\ \sin C$, and therefore B must be greater than C (I. 18). The converse evidently follows (I. 19).

Again, by composition the proportion becomes

$$b + c : c = \sin B + \sin C : \sin C.$$

and compounding this with a proportion derived from the 2d of β,

$$b + c : a = \sin B + \sin C : \sin A.$$

Suppose another triangle A′B′C′ on the same base a inclosed within ABC, so that $B\ 7\ B'$ and $C\ 7\ C'$ then also $A'\ 7\ A$. This triangle will also have

$$b' + c' : a = \sin B' + \sin C' : \sin A'.$$

Compounding $b + c : b' + c' = (\sin B + \sin C) \sin A' : (\sin B' + \sin C') \sin A$.
But the second antecedent is entirely greater than its consequent;

$$\therefore \quad b + c\ 7\ b' + c' \ \ldots\ldots\ \ldots\ldots\ldots\ldots \ (\text{I. } 21)$$

If A′ fall on the base, $b' + c'$ will equal a

$$\therefore \quad b + c\ 7\ a \ \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \ (\text{I. } 20)$$

13. Consulting the first of γ. As A increases while acute, cos A decreases, hence a less amount is taken from $b^2 + c^2$ and a consequently increases. When A becomes obtuse, cos A is negative, and the third term therefore additive; now also then increase of A adds more to $b^2 + c^2$ and therefore to a^2. Always therefore if b and c remain

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* This notation is German, and very expressive, proportion being the *equality* of ratios.

constant, the increase of A increases a, and vice versâ, the increase of a will increase A, (I. 24, 25).

14. We proceed now to the general determination of triangles. We might first fix the conditions necessary to determine them in individuality, and then in species as Euclid has done; but it will be more consonant to the spirit of analysis to obtain the most general first. Dividing the equations (γ) by c^2 and (β) by c and writing $\frac{a}{c}$ as m and $\frac{b}{c}$ as n, we have

$$\left.\begin{array}{l} m^2 = n^2 + 1 - 2n \cos A \\ n^2 = m^2 + 1 - 2m \cos B \\ 1 = m_2 + n^2 - 2mn \cos C \end{array}\right\} \text{ and } \left.\begin{array}{l} n \sin C - \sin B = 0 \\ m \sin C - \sin A = 0 \\ m \sin B - n \sin A = 0 \end{array}\right\}$$

From these six equations, each involving three quantities, any two being given, the rest will be determined. The cases will be

First: m and n given or the ratios of the sides. Here the angles are determined by their cosines, and hence no ambiguity can occur. The form of the triangle is known, or its species determined (VI. 5).

Second: m and B given or the ratios of two sides (a,c) and the included angle. Still n being determined by the 2nd of the first set, the rest are determined as in the former case, and no ambiguity is involved. (VI. 6.)

Third: A, B and therefore C given; or the three angles. Here m and n are determined by the first two of the 2nd set, and there is no ambiguity. (VI. 4.)

Fourth: m and A given or the ratio of two sides (a, c) and, an angle opposite to one. In this case C is determined by the 2nd of the 2nd set: the sinal function entering occasions ambiguity. If m be > 1, a is greater than c and therefore A than C, whence C cannot be obtuse and there is no ambiguity; but if $m < 1$ or a is less than c, there is no way of avoiding the difficulty, unless the species of C be directly given. (VI. 7.)

If now the length of one of the sides be given in addition to the ratio in which it is involved, the triangle will be determined individually as well as in species. This can occur in 1st, 2nd and 4th cases, which produce (Euclid I. 8. 4 and 26) and (Young I. 26). There being no ratio given in the third case, there is no individual triangle determined by the three angles.

15. With regard to the linear properties of parallels. If a straight line cut the sides of a triangle or these produced, parallel to the base, a triangle is formed of the same species, and hence the sides are divided proportionally. The converse is similarly true (VI. 2). The base of the new triangle will also bear the same proportion to that of the primitive,

If now the base angles of the primitive triangle increase, so that the sides approach parallelism, the sides of the two triangles increase without limit, approaching equality as they do so, without limit. Hence when the sides do become parallel, the ratio is one of equality, and the frustrum of the triangle having become a parallelogram, it follows that the opposite sides of a parallelogram are equal (I. 34). If the parallelogram be rectangular, each pair of sides will be the *distances* between the other pair, hence parallels are equidistant.

The two very elegant propositions (VI. 3, A,) are fragments of an entire series relating to the segments of sides by lines drawn from the opposite angles. It is not the intention of this paper to touch on supplemental trains of inquiry, but only to sketch those on which the rest may be scaffolded with ease. The propositions in question may, however, be simply proved thus: If a line be drawn from A to a and making with c an angle called θ, the segment on a between this line and B is $\frac{c \sin \theta}{\sin (B + \theta)}$ & that between the line & C is $\frac{b \sin (A \sim \theta)}{\sin (B + \theta)}$ Their ratio is consequently always $c \sin \theta : b \sin (A \sim \theta)$, and will be reduced to that of $c : b$, when $\sin \theta = \sin (A \sim \theta)$. If the cutting line fall within the triangle, this gives $\theta = A - \theta$ or $\theta = \frac{1}{2} A$; (VI. 3). If without, $\theta = \pi - (\theta - A)$ or $\theta = \frac{1}{2} (\pi + A)$; (VI. A).

16. The area of any plane figure is a function of its sides and angles. But the sides can be projected on two rectangular axes by help of what precedes, hence the area is also determinable by means of these projections and the angles. The simplest area to consider is that of the rectangle, because if the origin be at one of its angles and the including sides be the axes, they are also the projections of the others. The angles are besides equal, and natural constants. Let the ratio of the sides to the linear unit be a and b, and that of the area to the superficial unit be A, then $A = \phi (a, b)$. Inspection and our previous

knowledge inform us at once, that if a be increased p times and b, q times, the area is increased pq times, hence $pq\mathrm{A} = \phi\,(pa,\ qb)$.

$$\therefore \mathrm{A} = \frac{\phi\ (pa,\ qb)}{pq} = \phi\ (a,\ b).$$

Hence $\phi\ (pa,\ qb)$ must be divisible by pq with a quotient independent of pq. Symmetrically therefore it must also be divisible by ab with a quotient independent of a and b; let the quotient of both divisions be k. Then

$$\phi\ (pa,\ qb) = kabpq.$$

$$\therefore pq\mathrm{A} = kabpq \text{ or } \mathrm{A} = kab.$$

Assuming now as is usual, that the superficial unit is the square on the linear unit, we find k by making $a = b = 1$ (the linear unit) $\therefore$ A $= 1$ (the superficial unit). Hence $k = 1$ and therefore

$$\mathrm{A} = ab.$$

17. From this well known theorem, the various properties of rectangular areas flow with the utmost facility. The first ten of Euclid's second book are reduced to the results of algebraic multiplication and division, remembering that area of square on a equals $a \times a = a^2$.

Recurring to equations γ in (12), if a perpendicular be dropped on a from A, the segment between it and B is c cos B ; call it s,

$$\therefore\ b^2 = a^2 + c^2 \pm 2\ as$$

the double sign depending on the species of B. If it be obtuse $2\ as$ is additive (II. 12); if acute, $2\ as$ is subtractive (II. 13); if it be right $s = 0$ or $b^2 = a^2 + c^2$, (I. 47). Similarly if $b^2 = a^2 + c^2$,

$$\cos \mathrm{B} = 0 \text{ and } \therefore \mathrm{B} = \tfrac{1}{2}\pi \text{ (I. 48.)}$$

18. A triangle is easily shewn to be half a rectangle on the same base, and with the same altitude, hence a triangle $= \frac{1}{2}$ *altitude* $\times$ *base.* The following consequences immediately result. Triangles or parallelograms on equal bases vary as their altitudes and vice versâ (Young VI., 12). Triangles and parallelograms having equal bases and equal altitudes are equal, and the contrary (I. 35, 36, 37, 38, 39, 40). If a be the base of a triangle Δ, the altitude or perp. from A $= c$ sin B

$$\therefore \Delta = \tfrac{1}{2}\, ac \sin \mathrm{B}.$$

$$\therefore \Delta : \Delta' = ac \sin \mathrm{B} : a'c' \sin \mathrm{B}'$$

If then the triangles (Δ, Δ') are equal and an angle in each (B, B′) equal, $ac = a'c'$ or the sides are reciprocally proportional (VI. 15).

If $ac = a'c'$ and $B = B'$; $\Delta = \Delta'$ (VI. 15). If again equal triangles have each a pair of sides reciprocally proportional, or $\Delta = \Delta'$ and $ac = a'c'$; then $\sin B = \sin B'$, or the angles contained by those sides are equal or *supplementary*. Also if B only $= B'$; $\Delta : \Delta' = ac : a'c'$. This extended to parallelograms is (VI. 23), as (III. 15) may be extended into (VI. 14).

Again, since two rectangles are as their products $ab : a'b'$, the truth of (VI. 16 and 17) is evident.

19. Considering the area P of a polygon in the light of a function of sides and angles, we have

$$P = \phi \left\{ a, b, c \ldots\ldots\ldots\ldots A, B, C \ldots\ldots \right\}$$ or in a numerical form

$$\frac{P}{a^2} = \phi \left\{ \frac{b}{a}, \frac{c}{a}, \ldots. A, B, C \ldots. \right\},$$ a being taken as linear and a^2 as superficial unit. Hence in all similar polygons $P : P' = a^2 : a'^2$. (VI. 19, 20.) If further $P'' : P''' = a''^2 : a'''^2$ and it be given $a : a' = a'' : a'''$ then *ex æquali*

$$P : P' = P'' : P''' \qquad \text{(VI. 22.)}$$

Likewise if $P : P' : P'' = a^2 : a'^2 : a''^2$ and $a^2 = a'^2 + a''^2$, then

$$P = P' + P'' \ldots \text{(VI. 31.)}$$

20. As we have treated areas, we might treat volumes. The right solid being of three dimensions $V = \phi\,(a, b, c)$. Increasing a p-fold, b q-fold and c r-fold V is increased pqr-fold and $\phi\,(a, b, c)$ is shewn to be $kabc$. The solid unit then assumed is the cube on the linear unit, and $V = abc =$ *altitude* × *base*. Hence the right prism is also *altitude* × *triangular base*. The oblique parallelopiped is also *altitude* × *base*. By these principles we see at once the truth of (XI. 25, 28, 29, 30, 31, 32, 33, D, 34, 40.)

21. The examination of the circle is divided into the consideration of angles, of chords, secants, and tangents (which have one general analytical character,) and of areas as connected with the circle.

Laying down the angle at the centre double of that at the circumference on the same arc, as in Euclid, it will apply even if the former be π or a reverse angle, (III. 20). One consequence is—all angles at the circumference on the same arc are equal, (III. 21). Another, that they will be $\frac{1}{2}\,(\pi - x)$, $\frac{1}{2}\,\pi$, or $\frac{1}{2}\,(\pi + x)$ as the angle at the centre is less, $=$, or greater than π; (III. 31). Lastly, if an angle at centre

$= x$, the reverse is $2\pi - x$; hence their halves or the angles at the circumference on opposite sides of the same chord are $\frac{1}{2}x$ and $\pi - \frac{1}{2}x$, their sum is therefore π (III. 22.)

If the angle θ at the circumference stand on the chord c, the radius being r, the angle at the centre is 2θ, and (by γ in art. 12) it is seen $c = 2r\sin\theta$. I assume the formulæ of trigonometry here, as they are all deducible independently by help of γ. Hence if c and r be constant, θ is constant; or if r and θ be constant, c is constant, (III. 26, 27, 28, 29), Also c is a maximum with $\sin\theta$, *i. e.* when $\theta = \frac{1}{2}\pi$ (III. 15).

22. Now as to lines intersecting a circle. Let P be a point whose distance from the centre is d, and ρ a secant through it inclined to d at an angle θ. Then ρ, d and r (the radius) form a triangle, the two former including θ; hence

$$r^2 = \rho^2 + d^2 - 2\rho d . \cos\theta$$

$$\text{or} \quad \rho^2 - 2\rho d\cos\theta = r^2 - d^2.$$

The quadratic form shews that there are two roots only. Hence the line cuts the circle in two points at most. The solution of the quadratic is

$$\rho = d\cos\theta \pm \sqrt{r^2 - d^2(\sin\theta)^2}$$

If the point be within the circle, $r > d$; and the roots are both always possible since $\sin\theta \leq 1$. If $\theta = \frac{1}{2}\pi$, the two values of ρ become equal; which with its converse is (III. 3). The increase of θ, diminishing $d\cos\theta$ and increasing $d\sin\theta$, will diminish ρ; the maximum of ρ being when $\theta = 0$ and the minimum when $\theta = \pi$ (III. 7). If θ be measured negatively and the secant called R, we shall have,

$$R = d\cos(-\theta) \pm \sqrt{r^2 - d^2.(\sin - \theta)^2}$$

$$= d\cos\theta \pm \sqrt{r^2 - d^2(\sin\theta)^2}$$

which shews an equal secant on the opposite side of the diameter, (III. 7).

The same is true if the point be beyond the circle, but as d is then $> r$, the line ρ will only cut the circle while $d\sin\theta$ is less than r, (III. 8). When $d\sin\theta = r$, $\rho = d\cos\theta$; since there is only one value the line ρ is a tangent and for that value $r^2 + (\tan)^2 = d^2$ or the tangent is perpendicular to the radius through the point of contact, (III.17, 18, 19).

23. By the theory of equations, if s and s' be the segments of ρ between the point P and the circumference, $ss' = d^2 - r_2$. Hence

when d is constant, or for secants through the same point, the rectangle of the segments is a constant quantity, (III. 35, 36). If the point be without the circle, d is greater than r and $d^2 - r^2$ is tan², therefore $ss' = \tan^2$ (36, 37.)

24. If two radii be drawn including a given angle θ at the centre, they determine a certain arc of the circle in length, as well as the sector corresponding to that arc. Denote the former by l, the latter by S; then (θ standing for the ratio of the angle θ to the right angle)

$$\frac{l}{r} = \phi(\theta) \text{ and } \frac{S}{r^2} = \psi(\theta)$$

Take p arcs equal to l, we have p angles equal to θ and p sectors equal to s;

$$\therefore \quad \phi(p\theta) = \frac{pl}{r} = p \cdot \phi(\theta) \text{ and } \psi(p\theta) = \frac{pS}{r^2} = p \cdot \psi(\theta)$$

The solutions of these equations are $\phi(\theta) = m\,\theta$ and $\psi(\theta) = n\theta$: m and n being certain constants

$$\therefore \quad l = mr\,\theta \text{ and } S = nr^2\theta$$

Hence if r remains the same, l and S are proportional to θ, (VI. 33).

25. We cannot determine m and n without the aid of limits, because they involve the comparison of curvilinear length with rectilinear length. If we bisect the arc continually and join the points of bisection, we shall have a series of polygons of chords whose perimeters approximate to the arc without limit, while the areas between them and the radii approximate at the same rate to the sector. Denoting the ratio of the chord of θ to radius by c; that of the chord of $\frac{1}{2}\,\theta$ by $c\left[\frac{1}{2}\right]$; that of chord of $\frac{1}{4}\,\theta$ by $c\left[\frac{1}{2}\right]^2$, and so on we have for the perimeters of the successive polygons,

$$cr;\ 2\,c\left[\tfrac{1}{2}\right].\,r;\ 2.^2c\left[\tfrac{1}{2}\right].^2r\ldots\ldots\ \ldots\ldots 2^nc\left[\tfrac{1}{2}\right].^n\,r$$

And their areas successively

$$\frac{r}{2}.\,cr;\ \frac{r}{2}.\,2\,c\left[\tfrac{1}{2}\right].\,r\ \ldots\ldots\ldots\ \frac{r}{2}.\,2^n\,c\left[\tfrac{1}{2}\right].^n\,r.$$

At the limit, therefore, the sector $= \frac{r}{2} \times$ arc, and consequently the area of the circle $= \frac{r}{2} \times$ circumference.

Also we calculate the chord of half an arc from that of the whole by

$$c\left[\tfrac{1}{2}\right] = \sqrt{\left\{2 - \sqrt{4 - c^2}\right\}}$$

Commence with the angle 60° or $\theta = \frac{2}{3}$ when $c = 1$, and calculate successively $c\,[\frac{1}{2}]$, $c\,[\frac{1}{2}]^2$ &c.; and we shall find the series of perimeters given above approach the limit $1.0471975511 \ldots \times r$, which is consequently the length of the arc of 60°; call it $\frac{\pi}{3}.\,r$, then $\pi = 3.14159\ldots$ and the circumference of the circle is $2\,\pi r$, and its area is πr; proving circles to be as the squares of their radii, (XII.^{2}).

Now recurring to the general formula for arc and sector; if $\theta = 4$, the arc becomes $2\pi r$ and the sector πr^2; hence $m = \frac{\pi}{2}$ and $n = \frac{\pi}{4}$; consequently $l = \pi r\theta$ and $S = \pi r^2\theta$

26. In conclusion, by freely applying the principle of limits, the pyramid is treated as the limiting value of a series of inscribed prisms,

$$\frac{\mathrm{B}h}{n^3}\cdot n^2,\quad \frac{\mathrm{B}h}{n^3}.(n\text{-}1)^2,\quad \frac{\mathrm{B}h}{n^3}\,(n\text{-}2)^2,\ \ldots\ldots\ \frac{\mathrm{B}h}{n^3}.\,2^2,\ \frac{\mathrm{B}h}{n^3}.1^2$$

where B is the base of the pyramid, and h its altitude, and n the number of inscribed prisms; the sum of the series is

$$\frac{\mathrm{B}h}{n^3}\cdot\frac{(n+1)\,n\,(2\,n-1)}{2.\ 3} = \frac{\mathrm{B}h}{6}\,\left(1+\frac{1}{n}\right)\left(2-\frac{1}{n}\right)$$

At the limit n is infinite, and the series completes the pyramid. Therefore

Pyramid $= \frac{1}{3}$ *base* × *altitude.*

This involves (XII. 3, 4, 5, 6, 7, 8, 9). The case of similar pyramids, (XII. 8,) is done by transformations into similar parallelopipeds.

Cylinders are the limits of polygonal prisms inscribed in them; and cones, those of the inscribed pyramids. Their properties are therefore the same as those of prisms and pyramids, their circular bases permitting a definite reference to the homologous lines, the radii. (XII. 10, 11, 12, 13, 14, 15.)

Lastly, the sphere is determined solely by its radius. Hence the volume of the sphere bears a determinate ratio to the cube of its radius.

27. Modern authors of the highest repute have concurred in deducing the theory of Trigonometry from the definitions of sin and cos, which I have adopted at the commencement of this paper, introducing the functions tan, sec, &c. as convenient abbreviations, but without any reference to their geometric meaning. (See Peacock's Report on Analysis. Brit. Assoc. 1833, page 291.)

The application of a few abstract principles to geometrical ideas of the simplest character enables us thus to develope the whole mass of complicated properties founded on them, in a comprehensive and concinnous mode; justifying by the result the daring paradox of D'Alembert, that the more abstractedly an investigation is carried on, the more lucid and satisfactory does it become. It must not, however, be for a moment forgotten that analysis is but the lever; the fulcrum of its support lies in the ideas peculiar to the subject to which it is applied. Without a vivid and distinct conception of them our labour is idle. Professor Whewell in his tractates has done mathematical education signal service by insisting on this point, and his own works on Mechanics, with those of Professor De Morgan on Algebra and the Differential Calculus, may be hailed as some of the most valuable gifts which the thoughtful student has received from the hands of the masters of science.

Description of a new genus of Falconidæ. By B. H. Hodgson, Esq.

In the Journal of the Society for April, 1836, p. 227, I described a species of Eagle as *Aquila pernigra,* but without noticing its singular peculiarities of form, as especially the unique foot, of which the outermost fore digit is even smaller, in proportion to the innermost, than in the human hand. There is no such foot heretofore described in the whole family. The rest of its structure, as the feeble legs and vast floating wings, agrees with *Milvus;* and, in sooth, our genus *Heteropus* should stand *inter Aquilinarum et Milvinarum stirpes,* and be thus characterized:—Bill and head small and undepressed, *aquilo-milvine.* Figure slender, with very ample wings and tail, the former rather exceeding the latter; their gradation aquiline, having the greatest quills incurved. Tarsi short and plumed. Toes nervous, unequal, the inner and hind highly developed, the inner being nearly as long as the central and stouter, the outer being much the shortest and feeblest: talons very acute, and unequal, but not highly curved. Type, *Aquila pernigra,* Nobis, *loc. cit.*

[*N. B.*—In Mr. Jerdon's Catalogue of the Birds of Peninsular India *(Madr. Jl.* No. XXIV, 68,) that naturalist remarks, that—"On the summit of the Neilgherries there is frequently seen a black Eagle, larger than the *Wokhab (Aquila Vindhiana,* Franklin), but of which I was unable to procure a specimen. I have heard it is also often met with in Coorg."—And in the privately circulated *Supplement* to this catalogue, Mr. Jerdon describes the female, and mentions having examined three specimens of this "curious Eagle," which he there classes as *Nisüetus ovivorus*, but with a double mark of doubt as to the genus; and he has since transmitted specimens of both sexes to the Society's Museum by the title of *Ictinàetus ovivorus*, but subsequently to the arrival of the foregoing paper by Mr. Hodgson, with whose former description of the species Mr. Jerdon's specimens accord in every particular. Moreover, with reference to the specific name bestowed by Mr. Jerdon, Mr. Hodgson had already stated that—"This is a shy bird, which adheres exclusively to the wild and mountainous tracts of the hills. Its body is entirely free from offensive odour and vermin, and its prey chiefly the Pheasants of the region it frequents, *as well as their eggs*."

Mr. Jerdon, on the other hand, did not fail to notice the peculiar structure of the feet, and I quote the following from his very interesting description: "This remarkable Eagle I have placed for the present, though with doubt, under the genus *Nisaetus*. It differs from it in superior length of wing and tail—its shorter tarsus, shorter toes, *and more especially in their comparative size—the outer toe and claw being remarkably small*, and the inner claw of very great size. *The extreme shortness of the outer toe* is, as far as I can recollect, peculiar to it among the diurnal *Raptores* of this country, though common among the Owls. Its habits, too, are, so far as I know, peculiar, and differ from those of the other Indian Eagles. * * * It hunts about the edges of the hills more generally than on the higher parts of the table-land, and most frequently over bushy ground, though I have also seen it over forest, both on the top of the hills and half way down the Coonoor ghaut. It sails slowly along with very little motion of the wings, usually very close to the ground, hunting tolerably regularly, not unlike the Harriers, and like them hardly ever alights except for the purpose of feeding.

"In the three specimens I have examined, I found that eggs and nestlings had formed its only food. Among these I recognized the eggs of the Hill Quail (*Coturnix erythrorhyncha*), of the *Malacocercus Somervillei*, and of some Doves (*Turtur tigrina* and *T. Cambayensis*), beside others I did not know, and several nestlings. I have seen it, since I procured my specimens, alight for a few seconds on a large bush over which it had been circling for some time, and apparently devour something. I found in this bush a Dove's nest empty, which had evidently been robbed. This Eagle thus appears to be habitually a robber of bird's nests; and as Doves, as well as some other birds, breed throughout the whole year, it can probably sustain itself mostly on its favorite food, though it doubtless occasionally destroys young, feeble, or sickly birds, and perhaps reptiles."

The *Limnaetus unicolor* is likewise a plunderer of nests, though I cannot say of the eggs contained in them. A fine specimen, presented by Mr. Frith to the Society, and shot in Mymunseng, first attracted that gentleman's attention by the alarm which was manifested upon its approach to a large banyan tree, upon which were several of the deep and massive nests of the *Sturnus contra*, one of which it immediately proceeded to pull to pieces, to rob of its contents, in which operation it was shot. It is not, therefore, improbable that the same habit will prove to be more or less prevalent among various true Eagles, *Spizaeti* (*Nisaëtus*, Hodgson), and Buzzards. The specimen adverted to agrees perfectly with the description of *Spizaëtus hastatus*, Lesson, in the 'Zoologie du voyage de M. Belanger,' and I believe it also to be the *Falco limnaetus*, Horsfield, v. *F. unicolor*, Temminck, constituting the *Limnaëtus unicolor*, Vigors. *Cur. As. Soc.*]—E. B.

Cymindinæ. Heteropus mihi. H. Ferrugra mihi.

2. Inside of Foot size of nature

T. Bennett del.

T. Black lith.

Proceedings of the Asiatic Society.

(Friday Evening, 10th February 1843.)

The monthly meeting of the Society was held on Friday evening[*] the 10th instant, the Honorable the President in the Chair.

The following gentlemen proposed at the last meeting were ballotted for and duly elected:—

The Rev. CHAS. IRVINE, of St. Xavier's College.

Lieut. BAIRD SMITH, B. E.

Baboo COSSINATH BHOSE.

JOSEPH ST. POURCAIN, ESQ. Chandernagore.

The usual communication was ordered to be made to them.

The following Members were proposed: Professor Mohl, Secretary of the Asiatic Society of Paris, proposed as an Honorary Member by H. Torrens, Esq. and seconded by R. Houston, Esq. It was referred, as in like cases, to the Committee of Papers, to report on the propriety of conferring this distinction.

Dr. TRANTER, Malwa Contingent, proposed by the Honorable the President, seconded by Mr. Masters.

The Acting Secretary reported to the meeting that he had enquired as to the state of the account of the transcription of the Veds, as requested by Major Troyer's letter, and that it appeared by reference to the Journal, vol. VIII. page 531, that the transaction was then taken over from Mr. James Prinsep's executor, and that a balance was due to the Society of rupees 233: 7: 15, from the French Government, which would now be claimed. Instructions had been sent to Benares to Judoonath Pundit, who formerly conducted the transcription, requesting him to continue it.

It farther appeared, as to the copies of the 4th Vol. of the Mahabarata, that a box containing 56 copies of it, with 56 copies of the Index, had been sent from the rooms in April 1840, and by an Office Memorandum, that the case had been shipped on the 9th September 1840, by Government on the ship *Larkins*, with a letter from Mr. Torrens; but no acknowledgment of the arrival of the case had been received from Europe. The Acting Secretary stated, that he had written full particulars of the above to Major Troyer.

The Acting Secretary stated, that under the orders of the President, a box containing the following works, in all 13 volumes, had been sent to His Highness the Pacha of Egypt from the Society by Dr. Wise, who had sailed on the *India* this morning. No letter could accompany the donation, because it was not possible to procure the proper kind of paper on which to write it during the Mohurrum.

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[*] Proceedings for January, 1843

Books delivered to DR. WISE, *for the Pasha of Egypt, on the 8th February,* 1843.

Fatawa Alemgírí, Vols. 1 to 6.
Inaya, Vols. 2d, 3d, and 4th.
Jawami ul Ilm ul Riazí, one copy.
Anis ul Musharrahin, one ditto.
Sharaya ool Islam, one ditto.
Khazanat ul Ilm, one ditto.

The Acting Secretary then read the following Minute, relative to the state of part of the premises.

Minute.

We, the undersigned, having, at the request of the Hon'ble the President and the Acting Secretary, examined the screen wall on the North side of the Society's House, are of opinion, that it is not in a dangerous state; that the cracks are only due to slight sinkings of other parts of the building very common in Calcutta; and that it is well supported by the manner in which the new building and its roof have been carried up and laid on. We therefore recommend, that the arch of the Eastern door only, be renewed, as being all that is at present required.

W. N. FORBES, *Lieut.-Col.*
Calcutta, Jan. 2, 1843. A. IRVINE, *Major.*

He further represented the utility of a Skylight over the Stair-case, which was ordered to be referred to the Committee of Papers.

The following Books were presented and purchased :—

List of Books received for the Meeting, on the 10th February, 1843.

The Calcutta Literary Gleaner, February 1843, Vol. i., No. 12. Presented by the Editors.

The Calcutta Christian Observer, New Series, February 1843, Vol. iv., No. 28. Presented by the Editor.

The Oriental Christian Spectator, 2nd Series, Bombay, 1842, Vol. iii. No. 12. Presented by the Editor.

Specimens of the Popular Poetry of Persia, translated by A. Chodzko, London, 1842, 8vo. Purchased.

J. J. Bayer's, Gemmarum affabre sculptarum thesaurus, 1720, fol. Presented by H. Torrens, Esq.

Gazophilacium Linguæ Persarum, Authore P. Angelo a S. Joseph. Amstelodami, 1684, fol. Presented by H. Torrens, Esq.

Piddington's Tabular View of the Generic Characters of Roxburgh's Flora Indica. Presented by the Author.

Piddington's English Index to the Plants of India. Calcutta, 1832, 8vo. Presented by the Author.

Actes de L'Academie Royale des Sciences, Belles-Lettres et Arts de Bordeaux, 1840, 2eme, Anneé, 1er. à 4e. trimestres, 1841, 3eme. Anneé, 1er. á 4e. trimestre et.

1842, 4eme. Anneé, 1er. trimestre. Presented by the Academie Royale de Bordeaux.

Meteorological Register for December, 1842, from the Surveyor General's Office.

A Chinese Wood Engraving and Description of the Porcelain Tower of Nankin. Presented by J. H. Stocqueler, Esq.

Read the following letter, received through the Private Secretary to the Right Honourable the Governor General :—

To the Secretary of the Asiatic Society of Bengal, Calcutta.

Washington, 1st June, 1842.

Dear Sir,—I have the honor to transmit to you copies of the constitution, and list of Members, of the National Institution for the promotion of Science lately established in this city, together with the first and second Bulletins of its Proceedings, and to request you to lay them before your Society, that its Members may become acquainted with the existence and objects of the National Institution, with a view to future correspondence. I have the honor to be with great respect,

Approved. Your most obedt. Servant,

J. R. Poinsett, Francis Markoe, Jun.

President National Institution. *Corresponding Secretary.*

To the Secretary of the Asiatic Society of Bengal, Calcutta.

Office of American and Foreign Agency,
New York, June 9, 1842.

Sir,—With reference to my respects of the 6th April ultimo, informing you of the enrolment of your Society among the Correspondents of the National Institution, upon my proposal, I have now the honor to transmit you the annexed letter of the Corresponding Secretary thereof of the 1st instant, and am, with great respect, Sir,

Your most obedt. Servant,
Aaron H. Palmer,
Corresponding Member of the National Institution.

Ordered.—That upon receipt of the papers referred to, the whole be duly acknowledged, with expression of the Society's desire to co-operate with the National Institution of Washington.

Read the following letter received through Mr. Gladstone of Messrs. Gillanders and Co. :—

Monsieur, *Bordeaux, le* 30 *Juillet* 1842.

L'Academie Royale de Bordeaux a reçu en 1839, de la Societe Asiatique de Calcutta, 24 cahiers comprenant le recueil de les travaux pendant les anneés 1836-1837; en meme temps elle reçut 4 volumes publiès par la meme Société sur la recherche des Antiquités, des Arts, des Sciences, et de la Litterature de l'Asie.

Elle a cherché plusieurs fois l'occsion de vous adresser l'expression de sa gratitude pour un don aussi précieux et aussi de vous faire parvenir le recueil des actes qu'elle publie régulierement depuis plusieurs anneés; comme elle n'a rien reçu de la Sociéte Asiatique depuis 1839, elle a lieu de craindre que ses envois n'aient pas étés fidèlement remis.

En conséquence elle a accepté les offres bienveillantes de Mr. Gautier un des ses membres, qui dirige un navire sur Calcutta, pour vous adresser ses remerciemens vous faire don de ses travaux, et vous prier de continuer un échange dout elle sent tous le prix. elle serait heureuse de former des relations durables et suivies avec une Société qui a rendu et rend d'important services aux Sciences, aux Lettres, et aux Arts, par ses lumieres, son zèle et ses belles publications.

J'ai l'honneur d'etre, Monsieur, votre très devoué Serviteur,
C. H. Valat, ***Secret. Gen. de l'Acad.***

A M. le Secrétaire de la Société Asiatique de Calcutta.

Ordered.—That the same, with the donation of Books be duly acknowledged.

Read letter from J. Beaufort, Esq., Seory, as follows:—

Last month the Collector of Beerbhom sold by auction a good deal of property belonging to the temple at Deoghur, amongst which was a heap of coins. Now, I cannot pretend to any knowledge of Numismatics, and I cannot tell whether the Society would value any of these coins; but as I thought it possible that some few of them might be curious, I bought some of each kind, and enclose them to you, for the benefit of the Society.

Should they prove to be of no value, I shall not care what becomes of them.

Your's truly,
J. Beaufort.

N. B. The following is a List of the Names under which I bought them.—The name is written inside of each paper.

The Coins, 68 in number, were found to be as follows:—

Benares Rupee,	1 Piece.
Patna, ...	1
Nepal, ...	1
Benares 2 Annas,	5
Jhansee, ...	1
Arcot, ..	4
Assam, ...	4
Nagpore, ...	4
Lucknow,	4
Nepal, ...	2
Unknown, ..	4
Assam Anna,	12
Arcot, ...	1
Nepal, ...	8
Unknown, ..	8
Assam Half Anna,	8
Total,	68

Seory, January 16, 1842.

Read extract of letter from D. F. McLeod, Esq. C. S. as follows:—

" I have long by the way purposed intimating to you this as a remarkable philological fact. It was clearly ascertained by a German Missionary, named Mr. Loesch, who was recently settled in this district, but sad to say, carried off with his companions by Cholera; that the language spoken by our Gonds is fundamentally the same with the Canarese. Mr. L. had become familiar with the latter formerly at Mangalore and other places under the Bombay Presidency; and found himself able almost to converse with the Gonds, or at all events to make himself in a great measure understood by them by using this language; and being a gentleman of great acquirements and philological acuteness, had he lived, I have no doubt he would have been able to throw much light on the interesting question of the origin of this people. It has been decreed otherwise, but were the fact generally known, Canarese scholars might be induced to turn their attention to the subject.

Read a note from Dr. Campbell of Darjeeling, on the "Bora Chung," or Burrowing Fish, which was referred to the Editor of the Journal for publication. Also a paper from Lieut. Shortrede, of the Trigonometrical Survey, on Meteors observed by him on the night of the 18th August, 1842. Referred to the Journal for early publication.

The thanks of the Society were ordered to be expressed to the various donors and contributors of all the foregoing.

Reports of the Librarian were read as follows:—

H. PIDDINGTON, ESQ.

Acting Secretary Asiatic Society.

SIR,—My report of this month refers to the collection of Roman, Greek, Indo-Grecian and Indo-Scythian coins in the cabinet of the Society, which have been arranged, numbered, and labeled, and I have now the pleasure of submitting to you three lists, exhibiting an arrangement, and a detailed description of the coins.

The Roman coins amount to 297, all of Roman Emperors, from Augustus down to the destruction of the Occidental empire. With the exception of a few, they are not remarkable for their rarity. Mr. J. Prinsep, in his description of the Roman coins in the possession of the Society, observes (As. Jour. Vol. I. p. 391,) that most of them were found in India, which would certainly give them some interest; but those coins being no where specified, it is now impossible to identify them. A few of these coins are of silver, and none of gold; the only gold coin and some silver ones, formerly in the cabinet, being lost. But a comparison of the present list with that of the late Mr. J. Prinsep will shew, that the cabinet has not been greatly diminished. I here place the lists in juxta-position.

	Coins at present in the cabinet.	*Coins in the cabinet according to the statement of Mr. J. Prinsep.*
Silver coin of Augustus	 1	 4
Copper coins ditto ditto	 2	 4
Copper coins of Tiberius	 1	 0
Ditto ditto of Claudius	 4	 0

		Coins at present in the cabinet.	*Coins in the cabinet according to the statement of Mr. J. Prinsep.*
Silver coins of Nero		1	2
Copper coin of Galba		1	1
Silver coin of Vespasian		0	1
Copper coins of ditto		6	6
Copper coins of Titus		2	1
Ditto	ditto of Domitian	1	0
Ditto	ditto of Nerva	0	2
Ditto	ditto of Trajan	8	3
Ditto	ditto of Hadrian	9	8
Ditto	ditto of Lucilla	3	1
Ditto	ditto of Antonin	11	45
Ditto	ditto of M. Aurel.	15	0
Ditto	ditto of Faustina	3	4
Ditto	ditto of Verus	1	0
Ditto	ditto of Commodus	23	16
Ditto	ditto of Septimius Geta	0	
Ditto	ditto of Julia	1	
Ditto	ditto of Severus	8	
Ditto	ditto of Maximinus	0	2
Ditto	ditto of Mammaea	1	2
Ditto	ditto of Gordianus	5	2
Ditto	ditto of Philippus	8	8
Ditto	ditto of Severa	1	0
Ditto	ditto of Decius	5	6
Ditto	ditto of Valerianus	2	0
Ditto	ditto of Gallienus	9	9
Ditto	ditto of Victorin	8	1
Ditto	ditto of Tetricus	3	1
Ditto	ditto of Aurelianus	2	3
Ditto	ditto of Probus	9	9
Ditto	ditto of Carus	4	0
Ditto	ditto of Numerianus	0	1
Ditto	ditto of Diocletian	30	41
Ditto	ditto of Maximian	30	30
Ditto	ditto of Constantin	47	28
Ditto	ditto of Maxentius	1	1
Ditto	ditto of Valens	0	3
Ditto	ditto of Crispus	1	0
Ditto	ditto of Licinius	1	0
Ditto	ditto of Decentius	1	0
Ditto	ditto of Constantin M	2	

	Coins at present in the cabinet.	*Coins in the cabinet according to the statement of Mr. J. Prinsep.*
Ditto ditto of Constantius	…… 14	…… 12
Ditto ditto of Theodosius	…… 3	…… 2
Gold Coin of Arcadius	…… 0	…… 1
Copper Coin of Honorius	…… 0	…… 1
Ditto ditto of Justinianus	…… 1	…… 1
Ditto ditto of Justinus	…… 1	…… 1
Ditto ditto of Mauricius	…… 1	…… 1
Ditto ditto of Zimias	…… 1	…… 1

It would be undoubtedly desirable to have a complete series of Roman coins, but as such collection is not directly connected with the purposes of the Society, and as there are other objects the attainment of which is of much higher importance, it is perhaps not advisable to encourage an increase of these coins for the present.

On the other hand, it cannot be urged too much on the attention of the Society to enlarge the collection of the Indo-Grecian, Indo-Scythian and Hindoo coins, in which the cabinet is very deficient, their number amounting only to 116 specimens, most of which are moreover duplicates, and their legends, types, etc. generally effaced. General opinion seems to transfer to the Asiatic Society as an hereditary obligation, researches respecting the Antiquities and History of Afghanistan, which can be instituted with propriety only by means of a large collection of coins.

To form this devolves the more on the Society, as there are few Societies placed in a more favourable position for collecting those coins, than the Asiatic Society of Bengal.

I would also beg to draw the attention of the Society to a branch of coins which has been investigated in part only. I allude to the coins of the ancient Hindoo Kings, allied by their coins to the Greeks and their successors, and I need not say, how valuable such a collection may prove to supply the large blank of historical account from Azoka to the Mahommedan conquest.

Of Grecian coins the cabinet contains no more than sixteen, and I beg to observe, that additions, especially to those of the successors of Alexander, are also desirable, as many of their types are closely allied to the Indo-Grecian coins, and show in typical representation the influence which Grecian art and genius had on the developement of Indian civilisation.

I take this opportunity of forwarding to you the list of books received into the Library during the past year, the number of which amounts to 260, an account of the Oriental publications from May 1838 to the 31st December 1842, and an abstract of the Oriental publications which have been sold from the 1st January to the 27th December 1842.

I have the honor to be, Sir,
Your obdt. Servant,
E. Roer,
Librarian Asiatic Society.

13th January, 1843.

CATALOGUE OF THE COINS IN THE CABINET OF THE ASIATIC SOCIETY.

A Catalogue of the Coins of Roman Emperors in the Cabinet of the Asiatic Society

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Augustus.

a. Silver.

1 Obv. Cæsar Augustus...atriae. Head of the emperor, well executed.—Rev....Caesares. Two figures, standing and supporting two shields, the one part covering the other. This coin is partly cut off, and undoubtedly the same with that, mentioned by Mediobarbus, page 39, where the complete inscription is C. et L. Caesares Augusti F. Cos. Desig. Princ, Juvent.

b. Copper.

2 Obv. Caes. Aug. Head of the Emperor (much effaced.)—Rev. Gloria. S C. Type, Victory, in her right a wreath, in the left perhaps a tuba.

3 Obv. Divus Augustus S. C. Head of the Emperor. Rev Diva Augusta. Type. A figure seated on a state-chair, holding in the right an ear, and in the left apparently a torch. B. C 14. V. Mediobarbi Num. Imp Rom. p. 44.

Tiberius Claudius Nero (A. D. 13—37.)

Copper

4 Obv. Head of the emperor (much effaced)—Rev. Γ Υ. A military figure, in the left a spear. —Donor H Torrens, Esq.

Tiberius Claudius (A. D. 41—54)

Copper

5 Obv. Imp. Claudius. Head of the emperor with radiated crown.—Rev. Apollini fons. Type, Apollo standing, in the right a palm branch, with the left placing something on an altar.

6 Obv. The same legend and type.—Rev. Aequitas Aug. The figure of Equity standing.

7 Obv. The same legend and type.—Rev. Felicitas Aug. A figure standing, in the left a cornucopiæ.

8 Obv. (Clau?)dius Aug. Head of the Emperor with radiated crown.—Rev. Fon. P. Jupiter standing holding thunderbolt and spear, found at Patna.—Donor — Rose, Esq.

L. Domitius Nero. (A. D. 54—68.)

1. ROMAN COINS

Copper

9 Obv. Legend illegible. Head of the emperor.—Rev. Securitas. A figure seated, in the left a spear, and approaching the head with the right (A D. 54) Med. p. 90. Found at Patna.—Donor — Rose, Esq

10 Obv. Nero Claudius Caes. Au · Head of the emperor with a wreath of laurels.—Rev. (R) om (a) Type not much discernible, probably Roma, seated on trophies.

2. EGYPTIAN COINS.

Silver

11 Obv ... ερω ... Κλαυ Κα ... Head of the Emperor with radiated crown.—Rev. Αυτοκρατ .... An eagle, a palm-branch in its right.

12 Obv ι.. ... αυ. ... The same as the preceding.

Servius Sulpicius Galba (A. D. 68—69.)

ROMAN COINS.

Copper.

13 Obv. Galba Imp. Caes......Head of the emperor. Rev. Legend and type indiscernible.

Flavius Vespasianus (A. D. (69—79.)

Copper.

14 Obv. (Imp.) Caes. Vesp. Aug. P. M. T. R. (...Cos) III. Head of the Emperor, wreathed with laurels —Rev. Leg. Ceres August. S. C. Ceres standing, holding ears, and a cornucopiæ, A. D. 71.

15 Obv. (I) m (p) Caes Vesp. Aug. P. M. T. R. P. (III). Head of the Emperor, facing to the left.—Rev. P. (a x) August. S. C. A figure standing, in the left a caduceus. A. D 71. V. Med. p. 113

16 Obv. Imp. Caes. Vespasian, Cos. VIII. Head of the Emperor.—Rev. Ceres August. S. C. Ceres standing, in the right holding ears, in the left a spear, A. D. 77. V. Med. p. 116.

17 Obv. Imp Caes. Vespasianus Aug. Cos. VIII. (The legend is running from the right to the left) Head of the Emperor with radiated crown.—Rev. Ceres August. Type, Ceres.

18 Obv. Imp. Caes. Vespasian. Aug. Cos. VII. P. P. Head of the Emperor, wreathed with laurels.—Rev. Provident S. C. Type. A temple, A. D. 77.

19 Obv. Divus Aug. Ves. ... ianus. Type as in 18.—Rev. (Aeq) uitas August, S. C. The type of Equity. A. D. 79. V. Med p. 117.

20 Obv. Vespasian. Aug Head of the Emperor (almost obliterated)—Rev illegible. S. C A figure standing.

Titus Flavius Vesp. (A. D. 79—81.)

Copper

21 Obv. T. Caes. Imp. Aug. ...... Cos VII Censor R —Rev Judæa Capta S. C Two figures under a palm-tree, effaced. A. D. 77 V. Obv. Med p. 123.

22 Obv. Leg illegible Head of the Emperor. Rev Providentia. Type, A temple.

T. Flavius Domitianus Vesp. (A. D. 81—96.)

Copper.

23 Obv. Imp. Caes. Domitian. Aug. Germ. Cos. XI Head of the Emperor, crowned with laurels. Rev. Germania Ca | p | ta. | S C. A trophy, on the left a figure (the Emperor) with a shield, kicking another, seated near the trophy. A. D 85

Nerva Trajanus (A. D. 98—117.)

Copper

22 Obv. Im. aes. Nerva Trajan. Aug. ... Head of the Emperor, crowned with laurels. Rev. O. ... Tr. Pot ...... Cos. II. (?) S. C. A figure standing before an altar.

23 Obv. Imp. Caes. Nerva Traja. .... the same type. Rev. Effaced.

24 Obv. Aug. Ger. Dac. P. M. Tr. P....... The same. Rev.......o Ro. S. C. Type. A figure standing, and holding in the left a cornucopiæ.

25 Obv. ... vae Trajano Aug. Germ. Dac. P. M. Tr. Cos. X. P. P The same type. Rev. (Opti mo (Principi) : A helmeted figure, seated on trophies and holding a spear in the left, and a Victory, as appears, in the right.

26 Obv. Imp. Caes. Nerva Trajan. Aug. Germ. Dacio. Head of the Emperor with radiated crown Rev.........P. R. VII. Imp. IIII. Cos. V. P. P. S. C. A figure, seated in a reclining posture, A. D. 103.

27 Obv. .... a Caes. Aug. P. Ma. Tr. P Cos. III (I) Head much effaced. Rev. ...... August. S. C. A figure standing, in the left a cornucopiæ.

28 Obv. ...... P. M. Tr. P. ...... Head of the Emperor with a crown of laurels. Rev. | Optim | o Principi S. C.

29 Obv, ... anus Aug. Cos. VIII. Bearded head of the Emperor Rev. ... or (gloria) S. C. A female, in the right a sacrificial vessel, in the left a cornucopiæ.

30 Obv. Legend illegible. Head of the Emperor with a laurel crown. Rev. Salu ... S. C. A female, holding with the left a sacrificial vessel over an altar.

P. Aelius Hadrianus (A. D. 117—138.*)*

Copper.

31 Obv. Hadrianus Augustus. Head of the Emperor. Rev. Feliatati Aug. Cos. III P P. The Pretorian ship. A. D. 129 (V. Med. page 130.)

32 Obv. The same legend. Head of the Emperor, crowned with laurels. Rev. Cos. III. A man riding on horseback.

33 Obv. Hadrianus Augustus P. P Head of the Emperor with radiated crown. Rev. Hilaritas (P) R. Cos. III. S. C. A figure standing and having two children at its feet. A. D. 129. vid. Med p 180.

34 Obv. Hadrianus Aug Cos. III. P P Head of the Emperor. Rev. Two figures standing and having their hands joined. Leg. Felicitas Aug. S. C., A. D. 130 vid. Med. p 182.

35 Obv. Hadrian. Aug. Cos. ...... Head of the Emperor, crowned with laurels. Rev. Fel. ic. a ...... S. C. A figure standing, and holding in the left a cornucopiæ.

36 Obv. | Traj | anus Had | rianus | Head of the Emperor crowned with laurels. Rev. Legend effaced. Type. A figure standing.

37 Imp. Cæsar Traj. Hadri. ...... Head of the Emperor with radiated crown. Rev. Pictas Augusti. S. C. A figure standing before an altar.

38 Obv. Imp. Caes. Trajanus Hadrianus. ...... Cos. II. Bearded head of the emperor with radiated crown.

39 Obv. Imp. Trajan Hadrianus. Head of the Emperor with radiated crown and part of the bust. Rev. ...... Cos. Concordia. A figure seated.

Lucilla, L. Aelii uxor.

Copper.

40 Obv. Lucilla Augusta. Head of Lucilla with part of the bust. Rev. L. P. | iet | as S. C. A female standing before an altar, with a small box and a sacrificial vessel. S. Med. p. 190.

41 Obv. The same legend and type Rev. Legend illegible. A figure seated with sacrificial vessel and cornucopiæ.

42 Obv. The same legend and type. Rev. Venus S. C. Venus standing, in the right a monkey and in the left a spear. Med. p 190.—Donor H. Torrens, Esq.

T. Aelius Hadrianus Antoninus Pius. (A. D. 138—161.*)*

Copper.

43 Obv. Antoninus Aug. Pius Tr. P. Cos. III. Head of the Emperor with radiated crown. Rev. Salus publica S. C. A. female figure, in the left a spear, the right raised over an altar.

44 Obv. Antonius Aug. Pius P. P. Tr. P. Bearded head of the Emperor, with a crown of laurels. Rev. III. Type of Sol.

45 Obv. Antonius Aug. Pius. The same type. Rev. Munificentia Aug. Cos. IV. An elephant moving.

46 Obv. ...... ninus Aug. Pius P. P. Type as in 44. Rev. Salus. ...... Cos. IIII. Type as in 43.

47 Obv. Antoninus Pius Aug. Type as in 43. Rev. P. M. Tr. P. XVII. Imp. .... Cos. IIII. A figure seated on trophies, in the left a spear, in the right some thing indiscernible.

48 Obv. ...... ninus Aug. Pius P. P. Type as in 43. Rev. P. T. XX. S......... S. C. Jupiter standing, with thunderbolt and spear.

49 Obv. Antonius Aug. Pius P. P. Tr. P. (X) XII. Type as in 43. Rev. Cos. IIII. S. C. A figure standing, and holding a cornucopiæ in the left, and a scale in the right. A. D. 150.

50 Obv. Ant ...... us P. P. Tr. P. XII. Type as in 26. Rev...... rtuna o | bac | quens. Cos. IIII. S. C. The type of fortune. A. D. 150. Med. p 204.

51 Obv. Antonius Aug. Pius P. P. Tr. P. XXIII. Type as in 43. Rev. Pietati Aug. Cos. III. S. C. Typo. A figure standing, holding in the right a scale, and in the left a cornucopiæ, at the feet two children, A. D. 161. Vid. Med. p 205.

52 Obv. Antoninus Aug. Pius R. P. Tr. P. ... The same type. Rev. ... Aug. S. C. A figure standing, holding in the right a wreath over an altar, and in the left a spear.

53 Obv. Antoninus Pius Aug. Head of the Emperor with a crown of laurels. Rev.——Cos. ... S. C. A naked Hercules standing, and holding in the right the club.

M. Aurelius Verus Antoninus (*A. D.* 161—180.)

ROMAN COINS

Copper.

54 Obv. Leg Aurelius Cæsar Aug. Pic. F. Head of M. Ant. Rev. | Tr. P. | ot III Cos. II. S. C A female figure standing, in the right apparently holding an ear, in the left a basket. A. D. 149. V. Med. 213.

55 Obv. | M. An | tonius Pius Aug. Germ. Head of the Emperor crowned with laurels. Rev. Venus Victri | x. | A figure standing. A. D. 164 (?)

56 Obv. M. Aurel. Antoninus Aug Armeni. ... The same type. Rev. ... XIX. Imp I. Cos. ... A figure standing, in the right a walking stick, at its feet a globe. A. D. 165.

57 Obv. M. Aurel. Antoninus Aug. Arm. Parth ... The same type. Rev. Tr. Pot. XX. Imp. ... S. C. A Victory standing, in the left hand a palm, and with the right having raised on a palm tree a shield, in which is written Vic. Part. A. D. 165. V. Med. p. 219.

58 Obv. M. Antoninus Aug. Arm. Pa. ... The same type. Rev. (Tr. Pot) XXI. Imp. Cos. III. S. C A victory, holding in the right hand a branch of laurels, and in the left a palm. A. D. 167. V. Med. 220.

59 Obv. M. Antoninus Aug. Germ. Tr. P. XXIX. The same type. Rev. Imp. VII. Cos. III. S. C. A military figure moving, in the right the Roman eagle, in the left some trophy. A. D. 167.

60 Obv. Imp. Caes. M. Aur. Antonius Pius. ... The same type. Rev. ...... XXXII. Cos. III. P. P. S. C. A figure standing, in its right a crown over a small altar.

61 Obv. M. A. Antoninus. Aug. Tr. P. XXXII. (?) The same type. Rev. Imp. VIII. Cos. III. S. C. Type. A Victory.

62 Obv. Holding a wreath with the right. rel. Antonius Aug. Pius Tr. P. XXXII. The same type. Rev. Imp. X. Cos. III. Type as in 61. P. R. S. C. A. D. 172. V. Med. p. 227.

63 Obv. M. Aurel. Antonius Aug. Tr. P. XXXIV. Head of the Emperor with radiated crown. Rev. Imp... Cos. P. P. S. C. Type as in 61. A. D. 180.

64 Obv. Divus M. Antoninus Pius. Bearded head of the Emperor. Rev. Cons | ecrati | o S. C. An eagle standing on a globe. A. D. 180. V. Med. p. 228.

65 Obv. M. ... toninus Aug. Type. Head of the Emperor with radiated crown. Rev. Salus Aug. Cos. ... S. C. Type. A female figure, the left hand raised over an altar.

66 Obv. Imp. Cæs. ... us Antoninus Pius Aug. Type as in 63. Rev. | Pax Aug. | ust ; S. C. Type indiscernible.

67 Obv. ... M. A. .. Germ. P. M. Head of the Emperor with a crown of laurels. Rev. Gen. Cola. A Genius, standing before an altar with a sacrificial vessel and a cornucopiæ.

b. Egyptian.

68 Obv. Μαρ Αυρ ... Head of the Emperor. Rev. ...... Cos. ΜΗΓ ... ΩΝΜΙΙΓΑ ... ΚΟЄ.

Annia Faustina M. Antonini.

Copper.

69 Obv. Faustina Augusta. Head of the Empress (effaced). Legend illegible ... S. C. A figure standing with cornucopiæ and sacrificial vessel.—Donor H. Torrens, Esq.

70 Obv. Faustinæ Aug. Pie Aug. F (i, V. Rev. Pudicitia. A figure seated.

71 Obv. | Faus | tina Augusta | Head of the Empress. Rev. Legend illegible. A figure standing before an altar.

L. Aelius Verus.

Copper.

72 Obv. ... (Cæs. L.) Aurel. Verus Aug. Head of Verus, crowned with laurels. Rev. Concord. Augustor. Tr. P. Cos. II. S. C. The two Cæsars, joining their hands. A. D. 161.

L. Aelius Aurelius Commodus (A. D. 180—192.*)*

Copper.

73 Obv. Imp. Aelius Cæsar Antoninus. Head of Commodus. Rev. A figure standing.

74 Obv. Imp. L. Ael. Cæs. ...... oninus Pius. Bearded head of the Emperor. Rev. Tr. Pot... Cos. Des. II. Type. A figure standing, holding in the right a branch and in the left a cornucopiæ, A. D. 178.

75 Obv. Commodus Antoninus Aug. The same type. Rev. ...... Vota D (e) c (enn | S) u | s | e Tr. P. VI. Imp. IV. Cos. (III) P. S. C. A stolated figure standing, and holding with the right a sacrificial vessel over an altar. A. D. 181. Vid. Med. p. 246.

76 Obv. M. Commodus Antoninus...... The same type. Rev...... Imp. VI. S. C. Type. A figure standing, in the right a caduceus, and in the left a shield, A. D. 182.

77 Obv. Leg. and type as in No. 74. Rev. T. R. (P.) VIII. Imp. V. IIII. P. P. S. C. Mars moving, in the right a Victory, in the left a javelin. A. D. 183. Vid. Med. p. 248.

78 Obv. The same legend and type as in 41. Rev... ... mp V. Cos. IV. The same type ; duplicate of No. 77.

79 Obv. M. Commodus... The same type as in No. 75. Rev...... VIII. Imp. VI. Cos. IV. P. P. S. C. A helmeted figure | seated on trophies, holding with the left a spear, and with right a Victory. A. D. 183. Vid. Med. 248.

80 Obv. Commodus... ninus Aug. Pi... Head of the Emperor with radiated crown. Rev. Imp. VI. Cos. IIII. P. S. C. Minerva moving, a javelin in the right, in the left a shield.

81 Obv. Aelius Caesar Aug. ... Bearded head of Commodus with part of the bust. Rev. Tr. Pot. VIII. Cos. II (11) S. C. A female figure holding a sacrificial vessel over an altar. A. D. 183.

82 Obv. M. Commodus. A | nt. P. Feli | x Aug. Brit. Type as in No. 77. Rev. XI. Imp. VII. (1). Cos. (V.) S. C. Type. A figure standing, in the right a scale, in the left a cornucopiæ. A. D. 186. Vid. Med. p. 251.

83. Obv. M. Commodus Ant. P. Felix Aug. Brit. Type as in No. 75. Rev. | V. | tuti Aug. P. N. ...... Imp. VIII. Cos. (V.) ... S. C. Type. A helmeted soldier standing, in the right a Victory, in the left a spear, and at the feet a shield. A. D. 187. Vid. M. p. 252.

84 Obv. Comm. Ant. P. Felix (Brit.) The same type as in No. 75. Rev. r. P. XIII. Imp. VIII. Cos. V. P. (P.) S. C. exergue. For. Re | d | Fortune seated, in the right a team (over a globe,) in the left a cornucopiæ. A. D. 187. Vid. Med. P. 252.

85 Obv. M. Comm. Ant. (P.) Felix Aug. Brit. Type as in No. 79. Rev. (P.) M.(T) r P. XII. (1) p. VIII. Cos. V. P. P. S. C. A Victory moving, in the right a crown of laurels. A. D. 188. Vid. Med 253.

86 Obv. ... mmod. Ant. P. Felix Aug. Brit. The same type as in No. 75. Rev. Gen. A (ug. Ferlii) (P. M. Tr. P. XV.) Imp VIII. (Cos VI.) S. C. A Genius standing and holding with the the right a sacrificial vessel over a burning altar, and in the left a cornucopiæ. A. D. 190. Vid. Med. 255.

87 Obv. L. Ael. Aur. Commod Aug. P. Fel. The same type as in No. 75. Rev. ...... XVII. Imp. VIII. Cos. VII. P. P. S. C. A figure standing, in the right apparently a caduceus, in the left a corncopiæ. A. D. 192.

88 Obv. ...... Aurel. Comm. Aug. P. Fel. The same type. Rev. Tr. P. XVII. Imp VIII. Cos. VII. The same type. Duplicate of No. 87.

89 Obv. ...... Imp. Caes. ... Commodus. The same type as in No. 75. Rev. Illegible. ...... S. C A figure standing, in the right a spear, in the left a shield.

90 Obv. M. Commodus Antoninus Aug. The same type as in No. 75. Rev. Legend illegible. S. C. Type. A Victory, holding with both hands apparently a military sign.

91 Obv. Legend illegible. Head of Commodus. Rev. Legend illegible. S. C. A figure seated holding in the right a globe, and leaning with the left on the chair.

92 to 95 Three Coins of Commodus.

Septimius Severus, (A. D. 194—111).

Copper.

96 Obv. | L. S. | ept. Sev. Pert. Aug. Bearded head of the Emperor, with a crown of laurels Rev. Legend illegible. S. C. A figure standing.

97 Obv. ...... rus Aug. ... ax. Head of the Emperor, with a crown of laurel. Rev. ...... VIII. Cos. IIII Three trophies raised on poles.

98 Obv. Legend illegible ; otherwise the same as the preceding.

Julia Aug. (Uxor Severi.)

Copper.

99 Obv. Julia | Do | mna Aug. Head of Julia. Rev. Victrici V | ener | i | S. C. Venus standing, half dressed, leaning on a column with the right, and holding an apple with the left. Med. p. 282.

Alexander Severus, (A. D. 225—235.)

Copper.

100 Obv. Imp. Caes. M. Aur. Sev. Alexander. Head of the Emperor with a crown of laurels and part of the bust. Rev. | Provide | ntia Deorum. S. C. The type of Providentia. A. D. 222. Vid. Med. p. 318.

101 Obv. .... xand. Aug. Head of the Emperor almost obliterated | Virt | us. Aug. A figure standing, in the left a spear, and in the right apparently a globe. A. D. 228. Vid. Med. p. 322. Found at Patna. — Donor — Rose, Esq.

102 Obv. Imp. Sev. Alexander Aug. The same type. Rev. ...... Tr. P. VIII. Cos. II. S. C. A figure standing.

103 Obv. The same legend and type. Rev. P. M. Tr. P. VIII. Cos. II. (1) P. S. C. A figure standing, holding in the left a staff in a transversal direction.

104 Obv. The same legend and type. Rev. P. M. Tr. P. VIII. Cos. S, C. A soldier (the emperor, says Mediobarbus) holding in the right hand a globe, in the left a javelin, and kicking with the right foot a helm. A. D. 230. V. M. p. 323.

105. Obv. Imp. Alexander Pius Aug. The same type. Rev....... XIII. Cos. III. S. C. The type of Sol moving. A. D. 234.

106 Obv. The same legend and type. Rev. Jovi Propugnatori. S. C. Type. Jupiter holding in its right the thunderbolt.

107 ...... Imp. Alexander Pius Augustus. The same legend and type. Rev. Providentia Aug. S. C. The type of Providentia.

Julia Mammaea (mater Alexandri Severi.)

Copper.

108 Obv. Julia Mammaea Augusta. Head of Julia, with part of the bust. Rev. Fecunditas Augustae. S. C. A figure standing, and holding in the left a cornucopiæ. Med. p. 326.

Gordianus Imp. (A. D. 283—244.*)*

Copper.

109 Obv. Imp. Gordianus Pius Fel. Aug. Head of the Emperor, with a crown of laurels. Rev. Liberalitas Aug. III. S. C. A figure standing and holding in the right a die, and in the left a cornucopiæ. A. D. 242. V. Med. p. 339.

110 Obv. Imp. Gordianus Pius. .... The same type. Rev. ... Tr. P. IV. Cos. ... A figure seated, in the right a branch. A. D. 241. Vid. Med. p. 339.—Donor H. Torrens, Esq.

111. Obv. Imp. Caes. M. Ant. Gordianus Aug. The same type. Rev. Gloria. ...... S. A. Victory standing.—Donor H. Torrens, Esq.

112 Obv. Imp. Gordianus Pius Fil. (III ?) Rev. Pax Aeterna. S. C. Type of Pax, (much effaced.) Donor H. Torrens, Esq.

113 Obv. Legend illegible. Head of the Emperor, with a wreath of laurels. Rev. A figure standing.

Philippus Arabs. (A. D. 242—49.*)*

Copper.

114 Obv. Imp. M. Jul. Philippus Aug. Bearded head of the Emperor with a crown of laurels. Rev. Felicitas Temp. A figure standing, in the right the caduceus, and in the left the cornucopiæ. A. D. 249. Vid. Med. p 343.

115 Obv. The same Legend and Type as No. 114. Rev. Principi Juvent. S. A. A figure clothed in military garments (figura paludata) in the right a globe, and in the left a spear. A. D. 247, Vid. Med. p. 350.

116 Obv. The same Legend and Type. Rev. Aequitas. Aug. S. C. The type of Equity standing. A. D. 248. Vid. Med. p. 346.

117 Obv. Leg. Imp. ... ppus Aug. The same Type | ae | | culares | Aug. A stag standing. A. D. 248. Vid. Med. p. 345.

118. Obv. The same Legend as No. 114. Head of the Emperor, with radiated crown. Rev. A monument, on which is written Cos. III. Leg. S aecula. ... A. D. 248, Med. p. 346.

119 Obv. The same Legend and Type as No. 114. Rev. Liberalitas Aug. III. Two Emperors, seated on their subsellia. A. D. 248, Med. p. 346.

120 Obv. The same Legend and Type. Rev. Leg. .... Aug. Type. A figure standing, in its left holding a cornucopiæ.

121 Obv. Imp. M. Jul. Philippus. Bearded head of the Emperor, with a crown of laurels.—Rev. Saeculum Novum. S. C. A temple supported by eight columns, in the midst of which a figure is seated. A. D. 248. Vid. Med. p. 346.

Marcia Otacilia Severa (Philippi Imp. Uxor.)

Copper.

122 Obv. Marcia Otacilia Severa. Head of the Empress. Rev. Concordia Aug. S. C. A Concordia, with cornucopiæ and sacrificial vessel.

Cn. Messius Quintus Trajanus Decius. (A. D. 249—250.)

Copper.

123 Obv. Imp. C. M. Q. Trajanus Decius Aug. Head of the Emperor, with a crown of laurels. Rev. Dacia. S. C. A figure standing, and holding with the right apparently a military sign.

124 Obv. Imp. .... M. Q. Trajanus Decius Aug. Head of the Emperor, with radiated crown. Rev. | liberali | tas Aug. S. C. A standing figure holding in the right a bag, and in the left a cornucopiæ.

125 Obv. Imp. .... us Dec. ? Head of the Emperor, with a crown of laurels. Rev. Liberalitas Aug. A figure standing, and holding in the left a cornucopiæ.

P. Licinius Valerianus. (A. D. 254—260.)

Copper.

126 Obv. Imp. C. P. Lic. Valerianus ? Aug. Head of the Emperor, with a wreath of laurels. Rev. Concord. S. C. A standing figure, holding in the right a sacrificial vessel, and in the left a cornucopiæ. A. D. 254.

127 Obv. Imp. C. P. Lic. Valerianus. Aug. Head of the Emperor. Rev. Legend illegible, and the type much effaced.

Gallienus. (A. D. 254—268.)

Copper.

128 Obv. Gallienus Aug. Head of the Emperor with radiated crown. Rev. E. G. (X) I. .. Cl. VI. P. VI. T. Neptune standing, in the right a trident, in the left apparently a dolphin. A. D. 259. Vid. M. p. 373.

129 Obv. The same legend and type. Rev. elic. .. A figure seated, holding in its right a palm branch.

130 Obv. The same legend and type. Rev. Leg. Apollo. A figure standing.

131 Obv. The same legend and type. Rev. Probit. A female figure standing, and holding in the left a cornucopiæ.

132 Obv. The same legend and type. Rev. Jovi Victori. Jupiter standing and holding in his right the thunderbolt.

134 .... nus. The same type. Rev. Pax Aeterna Aug. A figure holding in the right a palm branch.

134-6 Three coins of Gallienus.

M. Aurelius Victorinus. (*A. D.* 268.)

Copper.

137 Obv. Imp. C. Victorinus P. F. Aug. Bearded head of the Emperor with radiated crown. Rev. Untraceable Found near Patna. Donor — Rose, Esq.

138 Obv. The same. Rev. A figure standing.

139 Obv. The same. Rev. Undistinguishable.

140 Obv. The same. Rev. (Pietas) ? Aug. A figure standing, as it appears, before an altar.

141 Obv. The same. Rev. A figure standing.

142 Obv. The same. Rev. Providentia Aug. Type of Providentia.

143 and 144 Obv. The same. Rev. A figure standing.

P. Piverus Tetricus. (*A. D.* 268.)

Copper.

145 Obv. Imp. Tetr | icus | .. Bearded head of the Emperor with radiated crown. Rev. Aug. A figure standing, and holding in the right a spear.

146 Obv. Imp. C. Te | tricus | the same type. Rev. Victoria (Aug.) Victory moving, in the left a palm, in the right a crown of laurels.

147 Obv. .. icus.

L. Domitius Aurelianus. (*A. D.* 270—275.)

Copper.

148 Obv. Imp. Aurelianus Aug. Head of the Emperor with radiated crown and part of the bust. Rev. Jovi Conser. Two figures, standing opposite each other.

149 Obv. The same Legend. Head of the Emperor with a crown of laurels. Rev. Concordia Aug. The Emperor, in his left a spear and giving his right to the empress.

Probus. (*A. D.* 276—288.)

I. ROMAN COINS.

Copper.

150 Obv. Imp. C. Probus P. F. Aug. The head of the Emperor with radiated crown and bust, in his right holding the Roman eagle. R. Virtus Aug. 2. XX. T. A soldier standing, in his left shield and spear, in his right a Victory. A. D 276. Med. p. 412.

151 Obv. Virtus Probi Aug. Head of the Emperor helmeted, in the right the spear, in the left the shield. Rev. Provident. Aug. S. XXI. C. A figure standing, in the right a globe, and in the left a transversal spear. A. D. 276.

152 Obv. The same Legend. Head of the Emperor with radiated crown and bust. Rev. Adventus August. The Emperor on horseback, his right raised, in his left holding the sceptre, a figure seated on the ground. A. D. 278. Med. p. 412.

153 Obv. The same Legend and Type. Rev. Fides milit. XXI. A figure standing, and holding in each hand a standard.

154 Obv. The same Legend and Type. Rev. Conservat Aug. T. XX. A naked Apollo with a glory round his head. The right hand raised, in the left a globe.

155 Obv. The same Type and Legend as No. 150. Rev. Virtus Augusti. A soldier holding in the left a spear, and touching the shield with the right.

156 Obv. The same. Rev. Pax. Aug. III.... XXI. A figure holding in the right a branch, in the left a spear in a transversal position.

157 Obv. The same. Rev. Soli Invicto C. M. XXI. S. Sol on his quadrigæ, surrounded by a glory.

II. EGYPTIAN COINS.

Copper.

158 Obv. ΚΜΑVΡΠΡΟΒΟCЄΕΒ. Head of the Emperor. Rev. L B. anno 2: An eagle, bearing a laurel wreath. A. D. 277.

M. Aurelius Carus. (A. D. 282—83.)

EGYPTIAN COINS

Copper.

159 Obv. ΚΑΡΟΣ. Donor H. Torrens, Esq.

160 Obv. ΑΚΜΑΚΑΡΟCЄΕΒβ. Head of the Emperor with a crown of laurels. Rev. L A. A. D. 282. A female, holding in the right a scale, and in the left a cornucopiæ.

161 The same.

162 Obv. ΑΚΜΑ ΚΑΡΟΣ ΣΕΒ. Head of the Emperor with a crown of laurels. Rev. L B (anno 2). A. D. 283. Female, holding with the left hand her robe, and in the right a flower.

Diocletianus. (A. D. 284—304.)

I. ROMAN COINS.

Copper.

163 Obv. Imp. S. C. Val. Diocletianus. P. F. Aug. Head of the Emperor with radiated crown and bust. Rev. Jovi Conservat. S. XXX. T. Jupiter standing, in his left a spear, in his right a thunderbolt, and at his feet a boy. A. D. 284. Vid. Med. p. 224.

164 Obv. Imp. C. Val. Diocletianus. P. F. Aug. The same type as 163. Rev. The same Legend. Exerg. T. XXI. T. Type. Jupiter standing, in his left a spear, in his right the thunderbolt.

165 Obv. Imp. C. Val. Diocletianus Aug. Type as in No. 163. Rev. The same Type and Legend as in No. 115.

166 Obv. Legend and Type as in No. 163. Rev. Type and Legend as in No. 164.

167 Obv. Legend and Type as in No. 164. Rev. Legend and Type as in No. 163. Exerg. P. XXI. T.

168 Obv. Imp. C. C. Val. Diocletianus Aug. Type as usual. Rev. as in No. 163.

169 Obv. Imp. Diocletianus Aug. Head of the Emperor with radiated crown and

part of the bust. Rev. Jovi Conservat Aug. XXI. B. Type as in No. 163.

170 Duplicate of No. 169.

171 Obv. Legend and Type as in No. 164. Type as No. 160. Rev. Type and Legend as in No. 163. Exerg. S. XXI. T.

172 Obv. The Legend and Type as in No. 169. Rev. Legend and Type as in No. 169. Exerg. XXI. Δ

173 Duplicate of No. 172.

174 Duplicate No. 172.

175 Obv. Legend as in No. 163. Type as in No. 169. Rev. Jovi Conservatori XXI. T. Type as in No. 164.

176 Obv. Legend as No. 163. Rev. Leg. as in No. 163. Exerg. XXI. Δ. Type as in No. 164.

177 Duplicate of No. 176.

178 Duplicate of No. 176.

179 Obv. as No. 168. Rev. Legend and Type as No. 119. Exergue. XXI. t.

180 Duplicate of No. 175

181 Duplicate of No. 179.

182 Duplicate of No. 179.

183 Obv. Legend as in No. 163. Type as in No. 166. Rev. Jovi Conserv. Aug. Jupiter standing, the spear in his left, the thunderbolt in his right, and the eagle at his feet E. XXΩIB.

184 Obv. Legend and Type as in No. 163. Rev. Jovi Conservat. III. XXI. T. Type as in No. 164.

185 Legend as in 172.

186 Obv. Legend as in No. 164. Rev. Herculi Conservat (P. XXI.) T. The naked Hercules standing, supporting his right on his hip, in his left the lion's skin and a club, leaning on a monument.

187 Obv. Imp. Diocletianus P. T. Aug. Head of the Emperor, with a crown of laurels and part of the bust. Rev. Salus Aug. et Caess. Fel. Part. A female figure standing, in her left a branch, in the right a bushel of ears.

II. EGYPTIAN COINS.

Copper.

188 Obv. .. ΔIOKΛHTIANOSΣEB. Head of the Emperor with a crown of laurels. Rev. A female with wreath and cornucopiæ L Γ (A 3) A. D. 286.

189 Obv. ΔIOKLHTIANOS ΣEB Rev. LH *(a8.)* Jupiter naked with a spear in the left, and the thunderbolt in the right. A. D. 292.

190 Obv. ΔIOKΓHTIANOS. Rev. LI (anno 10.) The eagle bearing a wreath. A. D. 294.

191 Obv. The same legend. Rev. A female helmeted; in the right hand a Victory, in the left a cornucopiæ. A shield on the ground LΔ (anno 4.) A. D. 287.

192 Obv. AUT. OUA ΔIOKLHTIANOS ΣEB. The same Legend. Rev. A Victory, holding in the right a wreath LΔ (anno 4.)

Maximianus. (*A. D.* 286—304.)

I. Roman Coins.

Copper.

193 Obv. Imp. Maximianus Aug. P. T. Head of the Emperor with a crown of laurels and part of the bust. Rev. Genio Populi Romani A. G. S. A genius standing, with cornucopiæ and sacrificial vessel. A. D. 285. Med. p. 431.

194 Obv. C. Val. Maximianus Nob. C. Head of the Emperor with a crown of laurels. Rev. Legend and Type as No. 193. Exerg. aΘ.

195 Obv. Imp. C. Ma. Maximianus. P. F. Aug. Type as No. 193.

196 Obv. Maximianus Nob. Caes. Type as No. 194. Rev. Type and Legend as No. 193.

197 Obv. Maximianus Aug. Type as No. 193. Rev. Genio Augusti B. Genius standing with the usual attributes.

198 Obv. Imp. C. Val. Maximianus Aug. Head of the Emperor, with a crown of laurels and the bust. Rev. Gen. Pop. Rom. N. P. L. Q. A genius standing before a burning altar, in his right a sacrificial vessel, in his left a cornucopia.

199 Obv. Imp. Maximianus P. F. Aug. Head of the Emperor with radiated crown and part of the bust. Rev. Jovi Conservat Aug. XXI. Γ. Jupiter standing, in his left a spear, in his right the thunderbolt.

200 Duplicate of No. 199.

201 Duplicate of No. 199.

202 Duplicate of No. 199.

203 Obv. Legend and Type as No. 199. Rev. The same. No Exergue.

204 Obv. The same as No. 199. Rev. The same Legend and Type. Exr. XXI. Δ

205 Obv. As in No. 199. Rev. Legend and Type as in No. 199. Exerg. XXI A.

206 Duplicate of No. 205.

207 As. 199. Rev. Jupiter, standing, the eagle on his feet, and holding with his right a Victory.

208 Duplicate of No. 207.

209 Obv. Imp. C. M Val. Maximianus Aug. Type as No. 199. Rev. Legend and type as in No. 199. Exerg. T. XXI. T.

210 Obv. Imp. C. M. Val. Maximianus Aug. Type as No. 190. Rev. Jovi Conservat. Aug.. S. XXI. T. No. 199.

211 Obv. Imp. C. Ma. Val. Maximianus. P. F. Aug. Type as No. 199. Rev. Legend and Type as No. 199. Exerg. P. XXI. T.

212 As No. 199. Rev. Legend as in No. 199. Jupiter standing, the spear in the left, the eagle on his feet, and holding with his right a Victory.

213 Obv. Legend and Type as in No. 199. Rev. Virtus Augg. XXI. S. Hercules standing, and holding in his right the club, in his left some thing indistinguishable.

214 Obv. Imp. Maximianus P. Aug. Usual type. Pax. Aug. A figure standing, holding in its right a Victory on a globe, and in its left a transversal spear. A. D. 294 Med. p. 434.

215 Obv. Imp. Maximianus Aug. Rev. Pax. Aug. A figure standing.

216 Obv. Imp. (C. Va.) Maximianus P. F. Aug. The same Type. Rev. Concordia Militum. K. E. Two figures standing, holding in their right joined hands, a Victory standing on a globe.

II. Egyptian Coins.

Copper.

217 Obv. AKMA OYA MAΞ ΣEB. Head of the Emperor, with wreath of laurels. Rev. LA anno 1. Female holding an olive branch and two cornucopiæ, a star on the left. A. D. 284.

218 Obv. Head of the emperor (much effaced.) Legend illegible LΔ. (anno. 4.)

219 Obv. MAΞ ΣEB Rev. LS. An. 6. Rev. A winged female, holding a flower wreath in the right hand, and a palm branch in the left. A. D. 290.

220 Obv. AKMA OYA MAΞ ΣEB. The same type. Rev. LA. A Victory, holding in the right hand a wreath of laurels.

221 Obv. NOΣ ΣEB. The same. Rev. Δ (anno 4. A. D. 287.) The same Type.

222 Obv. NOΣ ΣEB. The same Rev. LΔ (anno 4.) A. D. The same type.

Constantius. (A. D. 306—337.)

Roman Coins.

Copper.

223 Obv. Constantius Aug. Head of the emperor, with a crown of pearls, and part of the bust. Rev. B. | eata Tra | nquillitas. A basket, within which Votis XX. Exerg. P. T. R. A. D. 325. Med. p. 466.

224 Obv. The same as 223. Rev. D. N. Constantinus. Max Aug. Exerg. A. P. Q. A wreath, in which is inscribed Vot. XX. A. D. 325.

225 Obv. The same Legend. Head of the Emperor, adorned with two strings of pearls. Rev. Providentiae Aug. S. M. K. A. The Pretorian camp, with a star above it. A. D. 330. Vid Med. p. 467.

226 Obv. The same as 223. Rev. The same excepting the Exergue, which is wanting.

227 Obv. The same as No. 223. Rev. Legend and Type as 225. Exerg.... T. S. T.

228 Obv. The same Legend. Head of the Emperor with a crown of laurels and part of the bust. Rev. Soli Invicto Comiti. T. T. Exerg. P. T. R. Sol with a radiated glory, his right raised, in his left a globe.

229 Obv. As in No. 228. The same Legend and Type. Inscription. S. C. Exergue. A. R. L.

230 Obv. As in No. 228. Rev. The same Legend and Type (effaced) Inscript (P. C.)

231 Obv. Constantius P. F. Aug. Usual Type. Rev. The same Legend and Type. T. on the left inscribed into a small wreath. Exerg. S. P.

232 Obv. As in No. 228. Rev. The same Legend and Type. Exerg. S. T. R. Inscript. T. T.

233 Obv. The same. Rev. Legend. Inscript. and Type the same. Exerg. P. L. C.

234 Obv. The same, excepting the Exergue, which is Ω I Ω.

235 Obv. The same as No. 228. Rev. The same excepting that F. T. is written instead of T. F. written.

236 Obv. Constantinus P. F. Aug. Head of the Emperor, with a crown of laurels and part of the bust. Rev. Legend and Type as in No. 228. Inscript. S, P. Exerg. M. S. L.

237 Obv. Imp. Constantinus Aug. Type as in No. 225, (effaced.) Rev. effaced, but we may recognise the figure of Sol, as in No. 228.

238 Obv. Imp. Constantinus. Aug. The same type. Rev. Soli Invicto Comiti. P. L. C. The same type.—Donor H. Torrens, Esq.

239 Obv. Imp. Constantinus. Aug. Laureled head of the Emperor, with the bust. Rev. Type of Sol. Legend illegible.—Donor H. Torrens, Esq.

240-41 Obv. Imp. Constantinus Aug. Laureled head of the Emperor, with bust. Rev. Legend and Type as in 228. S. C. Exerg. L. N.

(All these Coins from 228—241 were struck A. D. 309. Med. p. 461.)

242 Obv. Constantinus Aug. Head of the Emperor, with a crown of laurels. Rev. Germania Devicta. C. Exerg. P. L. C. Victory moving, in her left a palm, in her right a trophy, and a prisoner at her feet.

243 Obv. Constantinus Max. Aug. Head of the Emperor, with a broad crown and part of the bust. Rev, Gloria exercitus. S. M. N. C. Two soldiers armed with helmet, spear and shield, watching before two military signs.

244 Duplicate of the preceding.

245 Obv. .... us P. F. Aug. The same type. Rev. Fel. Temp. Re | paratio | A soldier, the shield on his left arm, throwing down a horseman with his spear.

246 Obv. Imp. Const....us T. F. Aug. Head of the Emperor (effaced.) Rev. (Fel.) Temp. Reparatio. Exerg. S. M. T. S. The same Type as No. 245.

247 Obv. Anti.. Type as No. 245. Rev. As it appears, the same as No. 245. Donor H. Torrens, Esq.

248 D. Constan.... Aug. Head of the Emperor, crowned with two strings of pearls, and part of the bust. Rev. The same Legend and Type as No. 245. Exerg. Rob. Inscript· Γ.

249 Much effaced, the same Type and Legend as No. 245.

250 Obv. As No. 245. Rev. Legend and Type the same. Exerg. S. M. H. B.

251 The same.

252-53 Two Coins of Constantinus.

254 Obv. Constantinopolis. A female figure helmeted, with a spear and part of the bust. Rev. Exerg. T. R. P. A Victory, with spear and shield, on a ship.

255 The same.

256 Obv. Urbs Romæ. A female head, adorned with the tunica palmeata bearing a crested helmet, being a representation of the town Roma. Rev. Ex S. M. T. S. E Romulus and Remus with the she-wolf. Above two stars.

257 to 269 Thirteen bad Coins of the same type.

1 *M. Aurel. Val. Maxentius. (A. D. 306—312.)*

Copper.

270 Obv. Maxentius. P. F. G. Aug. Rev. Victoria Æterna Aug. Nost. A Victory standing. This coin, the type of which is much obliterated, appears to be the same which is mentioned by Med. p. 450, where Victory writes on a shield Vot. XX. A. D. 307.

Flav. Julius Crispus. (Caesar. A. D. 316-326.*)*

Copper.

271 Obv. | Cr. |ispus Nob. C.... Helmeted head with bust, part of the shield and spear. Rev. (Beata) Tranquillitas. Votis XX. inscribed in a basket, above which a globe with three stars. A. D. 326. V. Med. p. 473. Found at Patna—Donor — Rose, Esq.

C. Val. Licinianus Licinius. (*A. D.* 306-324.)

Copper.

272 Obv. Imp. Val Lic | inius | P. F. Aug. Head of the Emperor. Rev. Jovi.... ori. Of the Type the eagle only is discernible.

Fl. Decentius. (Cæsar A. D. 350-358.)

Copper.

273 Obv. Mag. Decentius Nob. Cæs. Head of the Emperor with part of the bust. Rev. Vict. D. D. N. N. Aug. et Cæs. Two Victories raising a shield, within which Vot. V. Mult. X. and beneath it a star. A. D. 352. Med. p. 485.—Donor H. Torrens, Esq.

Constantinus Jun. (*A. D.* 337-361.)

Copper.

274 Obv. Constantinus Jun. Nob. C. Head of the Emperor with a crown of laurels and the bust. Rev. Providentiæ Cæss. sunt. The Pretorian camp with a Star above it.

275 Obv. Constantinus Jun. Nob. C. Helmeted head of the Emperor with bust. Rev. Beat. Tranquillitas. Exerg. Plon. Inscript. T. B. A basket, in which Vot. XX. and above which a globe with three stars. A. D. 335.

Constantius. (*A. D.* 337-351.)

Copper.

276 Obv. Fl. Jul. Constantius Nob. C. Head of the Emperor with part of the bust. Rev. Gloria Exercitus. Exerg. S. M. N. D. Two soldiers with shield and spear, watching before two military signs.

277 The same, excepting the Exerg., which is M. A. L. D.

278 Obv. D. M. Constantinus, P. F Aug. Head of the Emperor with two strings of pearls, and part of the bust. Rev. Fel. Temp. Reparatio Sin. III. The Emperor, in a ship, holding in his right a globe, in his left a spear. Victory, above which a star, sitting on the helm.—Donor H. Torrens, Esq.

279 Obv. The same Legend. Head of the Emperor, crowned with laurels, with part of the bust. Rev. Gerio Populi Romani. B. A Genius standing before a burning altar.

280 Obv. Constantius Nob. Caes. Head of the Emperor, with a crown of laurels, forming a circle round the middle of the head. Rev. The same legend and type as No. 277. Ex. L. P.

281 Obv. The same as No. 277. Rev. effaced.

282 Obv. Head of the Emperor, adorned with two strings of pearls. Rev. untraceable. Found at Patna-Donor. — Rose, Esq.

283 ...... tius Aug. Head of the Emperor, adorned wth two strings of pearls. Rev. A figure standing, in the left a globe, and in the right apparently a trident.

284 to 289 Six Coins of Constantius.

Fl. Theodosius Magnus.

Copper.

290 to 92.... dosius P. F. Head of the Emperor. Rev. (Gloria) Romanorum. Three figures (Med. thinks them to represent the Emperor with his sons Arcadius and Honorius. V. Med. p. 519) standing and armed with spears. Found at Mahabalipuram, and formerly belonging to Col. Mackenzie's Cabinet. A. D. 393.

Fl. Anicius Justinianus. (A. D. 527-65.)

Copper.

293 Obv...... nus P. P. Aug. Head of the emperor with jewelled head-dress and bust, holding in the right a globe with star, on the left a star. Rev. A+ A. D. 548.

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Fl. Anicius Justinus Jun. (A. D. 565-78.)

Copper.

294 Obv...... inus P. F. Aug. Head of the Emperor almost effaced. Rev. +
M
Con.

Fl. Tiber Mauricius. (A. D. 582-62.)

Copper.

295 Obv..... P. P. Aug. Face apparently of Mauritius, with jewelled head-dress and bust, hold in the right a globe and cross. Rev. A A. D. 585. V. Med p. 576.

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Joh. Zimias.

Copper.

296 Obv. Head apparently of Christ, almost obliterated. Rev. XRISTO SBASIΛ. Vid. Band. p. 738, where the full Inscription is given. XPISTOS BAΣIΛEYS BAΣIΛEΩN. A. D. 970

ADDITIONS.

C. Jul. Ver. Maximinus. (A. D. 235.)

Copper.

297 Obv. Imp. Maximinus Pius Aug. Laureled head of the Emperor with part of the bust. Rev. Providentia, Aug. S. C. Type of Providentia; a globe at her feet.

298 The same Obverse. Rev. Fides Militum S. C. A figure holding in each hand a military sign

299 Obv. Caesa. Trajanus Ha.... Head of the Emperor with radiated crown. Rev... r Pot. Cos I S. C. Exergue. ae. A figure seated, in the left a cornucopiæ.

300 Obv. Legend effaced. Head of the Emperor (Gallienus) with radiated crown. Rev. ..ollo Cos. A figure standing

301 A Coin of Crispus.

302 to 313 Twelve Coins of Constantinus.

314 to 323 Ten Coins of Roman Emperors.

224 to 397 Seventy-three bad Roman Coins.

B CATALOGUE OF GRECIAN COINS

1. *Coins of Greek Towns.*

1-2 Two Milesian coins, (copper.)

3 A silver tetradrachma. A lion moving with raised head. Double triangular symbol, surrounded by stars. Rev Jupiter seated, legend illegible. Described by Mr. J. Prinsep, Asiat Journ p 31.

2. COINS OF GREEK KINGS

1. *Macedonian of Kings.*

4 A silver drachma. Obv Head of Hercules beardless, covered with the lion's skin. Rev. Jupiter seated, holding an eagle in the right, and a staff in the left; on the left side ALE ΞΑΝΔΡΟΥ, below.. ΑΣΙΛΕ... Described by J. Prinsep, Asiat Journ. Vol. II. p. 31.

5 Another similar coin, semidrachma. Rev. ..ΞΑΝΔΡ.. on the field to the left M.

6 Another tedrachma of similar device. Legend illegible. Asiat. Journ. Vol. II., p. 31.

7 Another tetradrachma of similar device. Legend illegible.

2. *Syrian Kings.*

8 Silver drachma. Head of Demetrius with simple band. Rev. Jupiter seated on a solid altar, holding the thunderbolt. Down the sides ΒΑΣΙΛΕΩΣ ΔΗΜΗΤΡΙΟΥ. Mr. Prinsep remarks (Asiat. Journ. Vol. II, p. 32,) with regard to this coin: This coin of Demetrius is recognised to be Seleucidan, from the figure of Apollo, sitting upon a peculiar altar, described by Pinkerton as a hamper inverted.

3. *Ægyptian Kings.*

9. A silver tetradrachm, brought from Egypt by Mr. Drew. Obv. Head of the King with curled hair, encircled by a diadem. Rev. Jupiter's eagle, standing on a thunderbolt. Leg. ΠΤΟΛΕΜΑΙΟΥ ΒΑΣΙΛΕΩΣ ΙΑLIΗ (anno 18.) Mr. Prinsep observes concerning this coin—A coin of Ptolemy I. or the V, B. C. 204. as Pinkerton says, his coins have most the letters ΠΑ or ΣΑ, explained to signify Paphos or Salamis, both cities of Cyprus.

10 Another. Same device ΛΗ Anno 8.

11 Another D. D. LIΔ Anno 14.

12 Another D. D. LIE Anno 15.

13 Another D. D. LIΔ Anno 18.

14 A large copper coin. Head of the King with curled hair. Rev. An eagle.. ΛΕΜΑΙΟ... ΒΑ.. Ε.

15 Another copper coin.

16 Copper coin of a King unknown.

4. INDO-GRECIAN KINGS.

a. Eukratides.

17 Obv. Square copper coin. Helmeted head of the King. Rev. The two Dioscuri, as it appears, charging. Owing to this type, which is that of Eukratides, and the head of the King, it has been appropriated to that prince.

b. Menander.

18 Silver tetradrachma. Obv. ΒΑΣΙΛΕΩΣ ΣΩΤΗΡΟΣ ΜΕΝΑΝΔΡΟΥ. Head of the King with fillet and part of the bust, with the right hand throwing a thunderbolt. R. 𐨨𐨱𐨪𐨗𐨯 𐨟𐨿𐨪𐨟𐨪𐨯 𐨨𐨅𐨣𐨡𐨿𐨪𐨯 (Moharajara Tadatasa Minadasa.) Minerva facing the right, in the left the Ægis, with the right throwing a spear. Monogram.

19. The same Obverse. Rev. The same type and monogram. Legend 𐨨𐨱𐨪𐨗𐨯 𐨟𐨿𐨪𐨟𐨪𐨯 𐨨𐨅𐨣𐨡𐨿𐨪𐨯.

20 The same.

21 The same Obverse. Rev. The same legend. Monogram. Minerva facing the left, the thunderbolt in the right, and the Ægis in the left.

22 The same legend and type. Rev. The same, excepting that the monogram is to the left of Minerva, instead of to the right. The same legend, well preserved.

23 The same legend. Helmeted head of the King. Rev. The same legend. Minerva facing the left with monogram on the left.

24 The same.

25 The same with exception of the monogram, which is as in 21.

26 Copper coin, totally effaced; visible only the letter ME.

c. Hermes (?)

27 Copper head of the King, much effaced. Legend not traceabl

28 Another similar one.

29 Head of the King effaced. Grecian and Cabulian legend illegible.

30 A Coin of an Indo-Grecian King.

G. Coins of the successors of the Indo-Grecian Kings P. Barbaric Kings of Caubul. Great King of Kings.

COPPER.

1 Obv. not discernible. Rev. King on horseback to the right. Leg. ...... ΕΥΣΒΑΣ.

2-3 Two more.

4-5 Head of the King with a curly hair and flowing fillets. Rev. .... AЄ BACIΛCΛC. .... A horseman mounted with flowing ribbands; before him a three-pronged symbol, the complete legend is Σωτηρμεγας βασιλεις βασιλεων Wils A. A. p. 333, remarks: The position of the first of the series, if there was a succession, or if the individual, if alone, is undoubtedly subsequent to the Greek Kings of Cabul. The title of great King of Kings connects him with Azes, and that he was posterior to Azes, is indicated by a peculiar symbol, a trident with three prongs.

6-9 Four coins more.

2. *Coins of the Indo-Scythian Kings of Caubul.*

Kadphises.

COPPER.

10 Obv. King standing to the front with conical hat. Rev. effaced.

11 Another similar one.

12 Another of smaller size.

13-16 Four more.

17 Obv. Head of the King with Grecian legend illegible. Rev. Standing Hercules, Cabulian legend.

18-19. Two similar ones.

20 Cast of a gold coin. Figure of the King to the right with cap, the front of which projects to the right, and fillets, club in his right, carried in a car, drawn by two horses and driven by a minutive charioteer. BACIΛEYЄ OO HMO KAΔ ΦICHC. Rev. Naked figure to the front wearing a cap, the right hand rests on a trident.

21 Head of the King. In other respects the same with the preceding.

22 A similar one.

Kanerkes.

COPPER.

23 Obv. King standing to the right with coat, conical cap, and fillets, his right hand pointing downwards to an altar.

24-31 Eight coins of Kanerkes, much obliterated.

32 King standing before an altar. Rev. A figure with nimbus. Legend illegible.

33 King in Scythian dress, standing. Rev. Figure of an elephant.

34-37 Four similar coins.

38-41 Four coins more.

Ooerki.

Gold.

42 Obv. Bust of the King with high cap to the left, a club in his right. PAO oo HPKI KOPANO. Rev. Standing figure to the left, halo and rays round the head, the right extended, the left holding the hilt of the sword. Mon. MIIPO.

Baraora.

43 Obv. Cast of middle size. PAO NANO King standing to the left with curious cap and clad in mail; in the left holding a trident, the right pointing down to an altar, sword at the side. Leg. Rev. PAONAPAO. Figure of Shiva with hair hanging down both sides of the head; upper half of the body naked, the lower covered; behind him the bull, to the left a Monogram.

44-50 Seven more.

51 Obv. A figure of Kenorao seated cross-legged, with fillets and left hand raised. Rev. A figure standing. V. W. p. 368.

52-102 Fifty one Indo.-Scythian coins.

D. Parthian or Arsakian Coins.

103 A silver tetradrachma. Head of Arsaces (I.?) facing the right, with broad diadem and straight hair. R. Victory offering a crown to the King seated. Leg. ΒΑCΙΛΕΩC ΒΑCΙΛΕΩΝ ΕΥΕΡΓΕΤΟΥ ΕΠΙΦΑΝΟΥ ΦΙΛΕΛΛΗΝΟΥ. Asiat. Jour. Vol. II. p. 34.

104 Obv. Silver tetradrachma. Head with mitred cap, and this symbol behind it. Rev. Figure seated, holding a bow. Leg. ΒΑΣΙΛΕΩΣ ΕΠΙΦΑΝΟΥΣ. ΜΕΓΑΛΟΥ ΑΡΣΑΚΟΥ ΔΙΚΑΙΟΥ ΦΙΛΕΛΛΗΝΟΥ. According to the shape of the Greek characters of this coin it must belong to one of the first Arsaces.

105 Head with mitred cap and aquiline nose, well executed. Rev. Figure seated, holding a bow, under which there is a kind of altar formed like the letter A. Leg. ΒΑΣΙΛΕΩΣ ΒΑΣΙΛΕΩΝ ΕΥΕΡΤΕΤΟΥ ΔΙΚΑΙΟΥ ΕΗΙΦΑΝΟΥΣ ΦΙΛΕΛΛΗΝΟΥ. Character well delineated.

106 Another. Plain head dress; device and character very rude.

107 The same, but more legible.

108-9 Two similar ones.

110 Another, inscription legible, but in rude characters.

111 Another, Head of the King, to its right and left the moon and star. Rev. The same device, on the left of the figure this sign

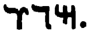
112 Another, with entirely barbarous character.

113 Head of the King with aquiline nose and pointed beard. Rev. A figure in

trowsers, seated with bow. Leg. ΒΑΣΙ ΛΕΩΣ ΑΡCΑΚΟΥ ΕΠΙΦΑΝΟΥΣ ΦΙΛΕΛΛΗ.

114 Obv. Head of the King with deep turban and mitred cap; bow behind, with fillets of the rudest fabrication. Rev. The same device. Character quite perverted.

E. Sassanian Coins.

115 Tetradrachm. Head of the King, with a cap or crown and curled hair. Rev. Sitting Hercules. Leg. in Cabulian character, . Asiat. Journ. II, p. 312. Wilson A. A. p. 225.

116 Head of the King, facing the left, with a large tuft of curly hair and a peculiar cap; round it the legend in Cabulian characters almost obliterated. Rev. A fire altar (mithra) with the head of the King upon it, two priests on both sides with swords. Asiat. Journ. II. p. 36.

F. Hindoo Coins.

Chandra Gupta series.

117 A Gold Coin. Obv. Figure to the left standing, with a halo round the head, a bow in the left. Legend imperfectly legible. Rev. A female, sitting cross-legged, the left hand supported on her hip. Asiat. Journ. Vol. V. p. 648. Asiat. Res. Vol. XVII.

Librarian's Annual Report.

Abstract of the List of Books, received into the Library, from the 21st January to the 31st December, 1842.

The number of all the Books, large and small, in different Languages, amounts to 269.

English.

Abstract of the Proceedings of a Committee for investigation of the Coal and Mineral Resources of India. Calcutta, 1842, (two copies.) 2 vols.

Address at the Anniversary Meeting of the Royal Geographical Society. London, 1841-1842. 2 pamphlets.

Annals and Magazine of Natural History, Nos. 47 to 59,—13 Nos. and Parts.

Annual Report of the Transactions of the Bombay Chamber of Commerce. 1840-41, 1 vol.

Ballantyne's Elements of Hindi and Braj-Bhaka Grammar. London, 1839, 1 vol.

——— Grammar of the Mahratta Language. London, 1839, 1 vol.

Baptist Missionary Magazine. Boston, No. 8.

Busawan Lal's Memoirs of the Puthan Sodier of Fortune. Calcutta, 1832, 1 vol.

Calcutta Christian Observer. New Series, 1842, vol. iii, 1 vol.

Calcutta Literary Gleaner, 1842, Nos. 1 to 8 and 10 (Nos. 4 two copies,) 10 Nos.

Calcutta Monthly Journal, 3rd Series, 1842. Nos. 83 and 84.—2 Nos.

Cantor's Zoological Sketch of Chusan. M. S. 1 vol.

Catalogue Gallery. London, 1840, vol. v.

Correspondence regarding the Discovery of the Tea Plant of Assam. Calcutta, 1841. 1 Pamphlet.

Cunningham's Map of the Comparative Geography of Central Asia, 1 No.

Darwin's Structure and Distribution of Coral Reefs. London, 1842, 1 vol.

Heynen's Tracts, Historical and Statistical, on India. London, 1814, 1 vol.

Ibraheem's Grammar of the Persian Language. London, 1841, 1 vol.

Irwine's Account of the General and Medical Topography of Ajmeer. Calcutta, 1841. 1 pamphlet.

Jameson's Edinburgh New Philosophical Journal, Nos. 62, and 64, two copies, and 65, 4 Nos.

Journal of the Bombay Branch of the Royal Asiatic Society. Nos. 2, 3.

Journal of the Royal Asiatic Society of Great Britain and Ireland. London, Vol. v. No. 10. four copies ; Vol. vi. No. 12. 5 Nos.

Journal of the Royal Geographical Society of London. Vol. x, Parts, 1, 2, 3 ; Vol. xi, Parts, 1, 2. 5 Nos.

Kerr's Sketch of Upper Assam. 1 vol.

Kittoe's Illustrations of Indian Architecture. 1 Vol., 4 Nos.

Lane's Dictionary, English and Burmese. Calcutta, 1841, 3 copies.

Lardner's Cabinet Cyclopædia—Natural Philosophy, Vol. i.

Laws and Regulations of the Egyptian Society. 1 pamphlet.

List of the Members of the Royal Asiatic Society of Great Britain and Ireland. 1841, 1 pamphlet.

London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science. 3rd Series, Vol. xix, Nos. 122 to 127 ; Vol. xx, Nos. 128 to 134 ; Vol. xxi. Nos. 135, 14 Nos.

Lyell's Principles of Geology. 6th Edition. London, 1840, 3 vols.

Mackenzie's (Col.) Plates, (13 pieces,)—13 Nos.

Macpherson's Report upon the Khonds of the districts of Ganjam and Cuttack. 1842, 2 copies.

McCosh's Medical Advice to the Indian Stranger. London, 1841, 1 vol.

Memoirs of the Royal Astronomical Society. London, 1840, Vol. xi.

Minutes of the Committee of Council on Education. 1840-41.—1 vol.

Moor's Notices of the Malayan Archipelago and adjacent Countries. Singapore, 1837, 1 vol.

Naturalist's Library—Entomology, Vol. vii., Foreign Moths. 1 vol.

———— ——— Ichthyology, Vol. iii., Fishes of Guiana. 1 vol.

———— ——— Mammalia, Vol. xi., Marsupials and Vol. xii. Horses, 2 vol.

———— ——— Ornithology, Vol. xii. British Birds. 1 vol.

Newbold on the Ipoh or Upas Poison, used by the Jacoons and other Aboriginal Tribes of the Malay Peninsula. London, 1837, 1 pamphlet.

Pemberton's Report on Bootan. Calcutta, 1839, 1 vol.

Prinsep's Runjeet Singh. Calcutta, 1834, (defective,) 1 vol.

Proceedings of the American Philosophical Society. 1841, Vol. ii., No. 17.

Proceedings of the Geological Society of London, 1841, Part ii. Nos. 76 to 83, 8 Nos.

——— of the London Electrical Society. Session 1841-42. London, Parts i. and iv, 2 Nos.

——— of the Royal Asiatic Society of Great Britain and Ireland. London, 1841, 1 Nos.

——— of the Zoological Society of London, 1840, parts viii.—1 No. and parts.

Reports of the British Association for the Advancement of Science. London, 1838, Vol. vii. and 1842, Vol. x, 2 vols.

——— (Sixth) of the Egyptian Society. 1842, 1 pamphlet.

——— on Projected Canals in the Delhi Territory, Allahabad. 1 vol.

——— on the Settlement of the District of Seharunpore, compiled by E. Thornton, 1840, 2 vols.

——— on the Training of Pauper Children, 1841, 1 vol.

Roget's Explanation of an optical deception. London, 1835, 1 pamphlet.

Royle on the Production of Isinglass along the Coast of India. London, 1842, two copies.

Sabine's Narrative of an Expedition to the Polar Sea. London, 1840.—1 vol.

Scott and Co's, Bengal Directory for 1842, 1 vol.

Silurian System, from the Edinburgh Review. 1841, 1 pamphlet.

Sketch in English and Khampti Characters, MS. (a sheet,)

Society for the Encouragement of Arts, &c. Premiums for 1840-41, 1841-42. London, 1840, (six copies,) 6 pamphlets.

Sprenger's El-Mas'udis' Historical Encyclopædia. London, 1841, Vol. i. 1 vol.

Spry's Plants, &c. required for India. Calcutta, 1841, 5 copies.

Sykes's Fishes of the Dukhun, (pages 349 to 378,) 1 vol.

——— Notes on the Religious, Moral and Political State of Antient India. London, 1841, 1 vol.

Transactions of the Agricultural and Horticultural Society of India. Vol. viii., 1 vol.

——— of the Geological Society of London, 1841, 2nd Series, Vol. vi. 1 vol.

——— of the London Electrical Society from 1837 to 1840, London. 1841, 1 vol.

——— of the Medical and Physical Society of Bombay, 1841, No. 4, 1 No.

——— of the Royal Society of Edinburgh, 1841, Vol. xv., Part 1, 1 No.

——— of the Society for the Encouragement of Arts, &c. Vol. liii. Part i., 1 No.

——— of the Zoological Society of London, 1841. Vol. ii. part 5, 1 No.

Trials of P. and M. Wallace. London, 1841, 1 vol.

Wight's Icones Plantarum Indiæ Orientalis. Vol. ii. Part 3, 1 No.

Wilson's Ariana Antiqua. London, 1841, 5 copies.

——— Sanskrit Grammar. London, 1841, 2 copies.

——— Translation of the Vishnu Purana. London, 1840, 1 vol.

Wujra Soochi, or Refutation of the Arguments upon which the Brahmanical Institution of Caste is founded, translated by B. H. Hodgson, 1839, 1 pamphlet.

Yarrell's History of British Birds. Vol. iii. Parts 26 to 30, 5 Nos.

French.

Actes de L'Academie Royale des Sciences, Belles Lettres et Arts de Bordeaux. 1839, 1 vol.

Adam, L'Espagne Artistique et Monumental, planches lithographies. 1 vol.

Annuaire du Bureau de Longitudes. Paris, 1836, 1 vol.

Bulletin de la Société de Géographie. 3me Serie. Paris, tomes, xv et xvi. 2 vols.

Catalogue de la Librairie D'Ab. Cherbuliez et Cie. à Paris et à Genève, 1 pamphlet.

Cuvier, Histoire Naturelle de Poissons. Paris, 1842, Tome, xvi, 1 vol.

Desjardins, Observations Meteorologiques faites a flacq. (a sheet.)

Foucaux, specimen du Gya-tcher-rol-pa, Partie du Chapitre vii. contenant la naissance de Cakya-Muni. Paris, 1841, 1 pamphlet.

Journal Asiatique, 3me Serie. Paris tome x, Nos. 56 a 58, tome xi, Nos. 59 à 64, tome xii, Nos. 65 à 69, tome xiii, Nos. 70, 71, 72, 16 Nos.

Journal des Savants. Paris, 1841, Mai à Decembre, et 1842, Janvier à Juin, 14 Nos.

Macaire et Auguste, Experiences pour servir a l'histoire de l'Acide Muriatique. Genève, 1824, 1 vol.

Macarie-Prinsep, Memoire sur l'influence des Poisons. Geneve, 1825, 2 pamphlets.

Marcel, Contes Arabes du Cheykh El-Mohdy. Paris, 1833, 6e, 7e, 12e Livraisons, 3 Nos.

——— de l'Action des Poisons sur le Regne Vegetal. Geneve, 1825, 1 pamphlet.

Mémoire de la Société de Physique et d'Histoire Naturelle de Geneve. Tome viii, 1ere et 2me parties, (two copies each,) tome ix, 1re partie, 5 Nos.

Programme de la Société Royale D'Agriculture et de Commerce de Caen. 1 pamphlet.

Reponse de M. de Paraveyà l'Article de M. Riamburgh sur l'Antiquités Chinoisas. Paris, 1836, 1 pamphlet.

Voyage Autour du Monde par les Mers de L'Inde et de Chine de M. Laplace. Paris, 1839, tome v, 1 vol.

Latin.

Callery, Systema Phoneticum Scripturæ Sinicæ. pars 1a and 2da, 2 Nos.

Hesychii Glossographi Discipulus. Edidit B. Kopitar. Vindobonæ, 1840, 1 pamphlet.

Glossarium Archailogicum. Authore H. Spelmanno. London, 1687, 1 vol.

German.

Bopp, über die Verwandtschaft der Malayisch Polynesischen, Sprachen, &c. Berlin, 1841, 1 vol.

Geschichte der Ilchane, dast ist, der Mongolen in Persien, Von Hammer. Easter-Band, 1 vol.

Hammer, Gamachscharis Goldene Halsbänder. Wien, 1835, 1 pamphlet.

Jahrbücher der Literatur, Nos. 93 to 96, 4 Nos.

Lassen, Zeitschrift für die Kunde des Morgenlandes, iv. Bd. i. Hept, 1 No.

Dutch.

Vosmaer's Baai of Kendari, Trigonometrisch Opgenomen. Outdekt, 1831 (Map,) 1 No.

Italian.

Di un Vaso Greco Dipinto che si Conserva nel real Museo Borbonico Discorso del Cavalier Bernardo Quaranta, 1 pamphlet.

Sula Figura e L'Iscrizione egizia in cise in uno smeraldo Quaranta. Napoli, 1826, 1 pamphlet.

Arabic.

Diwani Mootanubee Hooghly, 1841, 1 vol.

Aafhatul Yaman Hooghly, 1841, 1 vol.

Merrat-ul-Janaun, Maroof Tarikh-ia-phai, 1 vol.

Persian.

Tarikh Ferishta, 2 vols.

Hindee.

Naphasil, Lagawd, 1 vol.

Masnabee, Kanoor, 1 vol.

Raja Bolee, written in Bengalee Characters (Potee,) 1 vol.

Sanscrit.

Sahitya Derpana, 1828, 2 copies, Potee.

Burmese.

The Holy Bible, containing the Old and New Testament, 2d Edition. Moulmain, 1840, 1 vol.

Amount of Books in each Language.

English,	179
French,	54
Latin,	4
German,	8
Dutch,	1
Italian,	2
Arabic,	3
Persian,	2
Hindee,	3
Sanscrit,	2
Burmese,	1
Total,	259

Oriental Publications, &c. sold from the 10th January up to the 27th December, 1842.

Mahabharata, Vol. i. 8 copies; ii. 7 do.; iii. 9 do.; iv. 9 do.	Rs.	330	0	0
Index to do. Vol. i. 4 copies; ii. 3 do. iii. 3 do. iv. 3 do.		19	8	0
Raja Taringini. one copy.		5	0	0
Naishada, one copy.		6	0	0
Sausruta, Vol. 1 and 2, one copy each.		8	0	0
Fatawé Alemgiri, Vol. i. 2 copies; ii. 1 copy; iii. 7 copies; iv. 10 do. v. 7 do.; vi. 7 do.		279	0	0
Anis ul Musharrahin, one copy.		5	0	0
Jawame ul Ilm ul Riazi, one copy.		4	0	0
Persian Catalogue, one copy.		1	0	0
Asiatic Researches, Vols. xiii. to xx. and Index		80	0	0
Journal of the Asiatic Society, Vols. ix, x. and 11 Nos.		70	0	0
Sharaya ul Islam, 4 copies.		32	0	0
Total Rupees		839	8	0

ABSTRACT.

Account of the Oriental Publications, delivered, sold, and in store, from May 1838 *to the* 31*st December*, 1842.

Mahabharata.

	Vols.	1	2	3	4
Found and Received,	Copies	289	304	330	477
Delivered and Sold,	,,	35	35	36	158
Balance,	,,	254	269	294	319

Index to Mahabharat.

	Vols.	1	2	3	4
Found and Received,	Copies	489	491	498	493
Delivered and Sold,	,,	32	31	32	108
Balance,	,,	457	460	466	385

Harriwansa.

Found and Received,	Copies	494
Sold,	,,	5
Balance,	,,	489

Raja Taringini.

Found and Received,	Copies,	309
Delivered and Sold,	,,	23
Balance,	,,	286

Naishada.

Found and Received,	Copies	244
Delivered and Sold,	,,	25
Balance,	,,	219

Sausruta

	Vols.	1	2
Found and Received,	Copies	287	334
Delivered and Sold,	,,	26	27
Balance,	,,	261	307

Sanscrit Catalogue.

Found in the Library,	Copies	271
Delivered and Sold,	,,	16
Balance,	,,	255

Fatawe Alemgiri.

	Vols.	1	2	3	4	5	6
Found and Received, ...	Copies	141	101	35	109	155	165
Delivered and Sold, ...	,,	54	4	16	25	27	28
Balance, ...	,,	87	97	19	84	128	137

Innaya.

	Vols.	1	2	3	4
Found and Received, ...	Copies	0	38	31	33
Delivered, ...	,,	0	2	2	2
Balance, ...	,,	0	36	29	31

Khazanath-ool-Ilm.

Found and Received, ...	Copies	147
Delivered and Sold, ...	,,	54
Balance, ...	,,	93

Jawame ul Ilm ul Riazi.

Found and Received, ...	Copies	435
Delivered and Sold, ...	,,	41
Balance, ...	,,	394

Anis ul Musharrahin.

Found and Received, ...	Copies	365
Delivered and Sold, ...	,,	48
Balance, ...	,,	317

Sharaya-ool-Islam.

Found in the Library, ...	Copies	500
Delivered and Sold, ...	,,	165
Balance, ...	,,	335

Persian Catalogue.

Found in the Library, ...	Copies	262
Delivered and Sold, ...	,,	24
Balance, ...	,,	238

Asiatic Researches.

Vols.	3	7	8	9	11	12	13	14	15	16	17	18	18	18		19	19	19	20	20	20
Found & Received,	4	1	3	2	1	10	45	61	70	118	229	91	163	54	150	40	233	246	30	260	112
Delivered & Sold,	1	0	0	0	0	5	14	14	14	20	16	22	12	8	22	14	137	11	18	131	15
Balance,	3	1	3	2	1	5	31	47	56	98	213	69	151	46	128	26	96	235	12	129	141

Tibetan Grammar.

Found and Received,	Copies	211
Delivered,	,,	3
Balance,	,,	208

Tibetan Dictionary.

Found and Received,	Copies	208
Delivered,	,,	3
Balance,	,,	205

Read Report of Curator Museum Economic Geology as follows:—

Report of the Curator Museum of Economic Geology for January, 1843.

Museum Economic Geology.—We have received during this month, through Major Fitzgerald, Superintending Engineer S. E. Provinces, from Mr. Babington, Executive Officer on the Raepore Mail Road, a capital series of ores and mining products from the Kuttarbugga iron mine, 20 miles N. E. of Sumbulpore.

This collection is the most complete we have yet received, for it comprises every thing, from the crude ore to the finished product, which is noted by me as desirable in our circular, including a capital earthen model of the furnace, to scale, the tools, &c.

The ore itself is a peculiar one, being at first sight a common brown clay iron ore, but it is seen on closer inspection to be mixed with minute crystallised grains of the black hematite. It is not magnetic.

No. 2555.

To H. Piddington, Esq.
Curator to the Museum Economic Geology, Calcutta.

Midnapore, 7th January, 1843.

Sir,—Under instructions from the Military Board, No. 5498, dated 3rd instant, I have the pleasure to forward to you the accompanying Statement and a box, containing specimens of mining products, received from Mr. Babington, Executive Officer on the Raepore Mail Road. I have the honor to be, Sir,

Your obedient servant,
W. R. Fitzgerald, *Major,*
Superintending Engineer S. E. Provinces.

Mining Products, from the Kutterbagga Iron Mine, 20 *miles North East of Sumbulpore.*

1. Specimen of the crude ore, just as found.
  1. A Ditto of rock, or matrix in which found.
  1. B Ditto of earth between the veins.
  1. C Ditto of an inferior ore lying between the veins.
2. The ore after preparation for the furnace.
3. The ore does not contain gravel or stones.
4. No description of fluxes are used.

5. Charcoal used in smelting, made from saul, specimen marked O and from jam, marked X, the English name of the latter wood not known.*

6. The roasted or half smelted ore.

7. The pure metals, as obtained in a merchantable state, in all the qualities, marked D, E and F.

8. Slags of kinds, marked G and H.

9. Earthen model of furnace, and pipe in which bellows are inserted, together with a pair of bellows. The size of the furnace used by the Miners is three feet and six inches deep, by two feet and eight inches wide.

10. Specimens of tools: one large hammer, one small hammer, one pair of pincers; no anvils are used, the iron being beaten out on a large piece of granite.

The mine is situated twenty miles North East of Sumbulpore; there are no traditions as to when it was first discovered, but the Miners say that their families have worked it for ten generations. The gross produce at present is said to be, one thousand maunds Calcutta weight, per annum. Capital and skill are only required to produce an unlimited quantity, as the ore is abundant, and the forests inexhaustible. There is a tax of one rupee and four annas per annum levied on each furnace, paid by the Miners, who all work on their own account, so that it is difficult to form any estimate of their profits as they are cultivators of the soil, and carry on their smelting, when not otherwise engaged. The specimens of iron marked D and E, are sold on the spot for one rupee and two annas per bazar maund, and that marked F, at about eight annas per maund. The health of the Miners does not seem to be affected by their work; they all look well, and many of them attain to the age of seventy or eighty years; they are not subject to any peculiar diseases. With the exception of the cow and buffaloe, they eat almost every description of animal, and drink the mowah spirits to excess; this is their great failing, in all other respects they are not less moral than the other villagers. They do not appear to have any superstitions peculiar to themselves. When a new furnace is erected, and on opening the mine at the commencement of the season, a goat is sacrificed to Gauttailee, the goddess of the mine.

C. L. Babington,

Sumbulpore, 14th December, 1842. *Executive Officer, Raepore Road.*

By the permission of the Honourable the President, I have applied to the Government for a set of the Maps of the Atlas of the Grand Trigonometrical Survey for the use of the Museum, and these have been liberally accorded to us; they are now on the Table.

From Captain Goodwyn, B. E. we have received a great addition to our collection in a specimen of the native Asphaltum of Seysell, which is the origin of all the bituminous compounds used under the name of asphalt for road-making and other purposes in Europe. Captain G. informs me, that he has brought out with him about a ton of the prepared Asphaltum for trial in the flooring of rooms. It may be worth noticing here, that the whole lower floor of the Society's House, which was laid in 1839, by Colonel Macleod, with the common mixture of pitch, tar, lime and sand, continues perfectly dry, and even dusty, in the rains, though before it was, with the common pucka floor, most destructively damp. No traces of damp are any where to be seen now.

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* Most probably Eugenia *Yamboz.*—H. P.

GEOLOGICAL AND MINERALOGICAL.—We have obtained from the native contractor the two new mineral cases, though, as usual with them, with defects which require to be amended. When I can use them I hope to get on again, and finally, with our mineral arrangements, which now for want of room, it would be almost useless, and next to impossible to do.

We have to acknowledge here from Mr. W. H. Batten, who is most indefatigable in his labours to assist us, the last portion of that part of Captain Herbert's Journal edited by him. He has also kindly offered to give us a memorandum of (unavoidable) Errata in the Extra Number of the Journal, containing Captain Herbert's Reports, and to remark upon a few of his oversights. We have duly received the volume alluded to in his letter, and at my first leisure, I propose looking out the specimens to this part of the Journal.

From our liberal contributor Dr. Spilsbury, and through the kind assistance of Ensign Hickey, 1st Native Regiment, we have to announce the arrival of a magnificent fossil elephant's scull, of which until the matrix is cleared off, we can only say that it is Elephantine; that its width across the temples is about 36 inches; that of our largest recent elephant's scull being only 30.

The Society is specially obliged to Ensign Hickey, for his attention to this precious relic. He found it in the compound of a bungalow at Kamptee, and learning its history, most kindly brought it down to Barrackpore for us.

We have received from Government advice, that the box of minerals alluded to in my last is shipped on the *Prince of Wales.* H. PIDDINGTON.

1*st February*, 1843.

The business of the evening having terminated, the Honorable the President then rose, and with much feeling addressed the Members. He stated that it was now upwards of thirty years since he first joined the Society, then under the presidency of Mr. Henry Colebrooke. He was then a young Member of the Civil Service, and little dreamed that he should one day have the honour of filling a chair in which so many illustrious men had sat in succession. He would not advert to the history of the Society in this long period, during which he had been too severely tasked by public duty to do much which he had desired to do, and which, as a well wisher to the interests and objects of this Society he ought to have done, and much which he should have felt pride and pleasure in doing; but it was now his painful duty to state that he had placed in the hands of the Acting Secretary his formal resignation of the Presidentship; which would be duly brought forward at the next meeting by the Committee of Papers.

After so long a connection with the Society, from which he had, he felt, received far higher honours than he had deserved, he could only now, in bidding it farewell, assure every member of it of his continued interest in its labours, of his hearty wishes for its increasing prosperity, and of his sincere desire to forward its interests in every possible way.

Read a memorandum from the Zoological Curator (who from illness had been unable to prepare his report) on some new Monkies, Birds, &c. on the table.

SIR,—I have to acknowledge the following presentations to the Museum:—

From Captain R. Wroughton, as announced by letter in XI, 879,

A skin of a female Gaour *(Bos Gaurus)*, in very good condition;

One of *Crocodilus biporcatus*; and

A large arboreal Wasp's nest.

From J. C. Jerdon, Esq.

A box of various Fossils, from the Neilgherries, a list of which may shortly be expected.

From Mr. Ridsdale, of Bishop's College,

A skin of a Prion Petrel *(Pachyptila Frosteri)*.

Three species of Snakes, from Ceylon.

An *Echeneis remora*.

From Mr. DeCruz, of the Botanic Garden,

A most formidable species of true Viper, which I have been unable to find a name for, and wait in this and other instances for the publication of that part of MM. Dumeril and Bibron's valuable '*Histoire des Reptiles*', which treats of the *Ophidia*, before venturing to impose a name upon any species belonging to the order.

A fine *Varanus binotatus*, and some insects.

From Major Ouseley,

A specimen of *Saturnia Assamica*, from Chota Nagpore.

From our Honorary Secretary, Mr. Torrens,

A Rose-crested Cockatoo *(Plyctolophus rosaceus.)*

Among the numerous specimens obtained in the neighbourhood or purchased, I shall only notice two species of birds; viz.

Hyptiopus (Hodgson, olim *Baza*, H.,) *lophotes; Falco lophotes*, Tem. A beautiful pair, male and female, procured alive, and which had the power of erecting their crest quite vertically, as I doubt not is also the case with the various other Hawks similarly crested: and

Vinago? cantillans, Nobis. Male thirteen inches long, by twenty-one inches in alar expanse; wings seven inches; and tail five inches and a half, its form cuneated: bill to frontal feathers seven-eighths of an inch; and tarse three-quarters of an inch. Predominant hue a delicate pearl-grey, conspicuously tinged with ruddy on the crown and breast: fore-part of the wings maronne-red, which also deeply tinges the scapularies and interscapularies: belly faintly tinged with yellowish-green, and a trace of dingy green margining the rump plumage and the smallest tertiaries, also prevailing on the coverts of the secondaries, the greater series of which are slightly bordered with whitish-yellow: primaries and secondaries dusky, together with the extremities of the outer tail-feathers: vent white, the feathers of its sides having dark ashy centres; and lower tail-coverts whitish-buff, being more or less ashy at base. Irides as usual in this genus, or having a crimson ring encircling a violet one: bill and bare skin around the eye glaucous-blue; and legs and toes reddish carneous. This remarkable species is essentially a *Vinago*, though differing considerably from the typical species in the form of its bill and feet; insomuch that it might, with propriety, be elevated to the rank of a particular subgenus: the former is comparatively slender and elongated, having the basal three-fifths membranous and tumid, and the corneous extremity feeble; and the toes also are slender, and not broadened underneath. The specimen described was purchased alive, and was said to have been brought from Agra; but some *shikarees* to whom I shewed it decidedly recognised the species, at once remarking on the peculiarity of its note, and said that it is procurable in the Soonderbuns. Its *coo* is extremely remarkable, bearing no slight resemblance to the human voice in singing, and highly musical in tone; it is considerably prolonged in different cadences, and terminates very abruptly; but every time it is repeated exactly as before, so that it becomes wearisome, at least to an European ear*. This bird was sold to me as the *Kokla* Pigeon of the Upper Provinces, great numbers of which are kept in cages by the natives, for the sake of their music; but enquiry has led me to ascertain that *V. sphenura* is the true *Kokla* of the Upper Provinces, whereas in Bengal this term is applied to *V. bicincta*, Jerdon, both of these species differing from the common Hurrial *(V. militaris)* by having coral-red legs instead of gamboge-yellow ones, which is generally mentioned as the distinctive feature of the *Kokla*; the *V. bicincta*, however, has a less musical, or at least less varied, note than the Hurrial. The *coo* of the latter, if such it can be called, consists of a melodious deep toned whistling note, varied by a guttural sound; and those who are unacquainted with it would be apt to mistake it for the note of a true singing bird: that of *V. bicincta* is equally melodious, but less prolonged as well as less varied. I know of only the two last-named species of this genus in the vicinity of Calcutta.†

With much respect, I remain, Sir,
Yours obediently,
EDWARD BLYTH.

P.S.—As the foregoing Report is very brief, I shall take this opportunity to revise my previous Reports to the Society, commencing with Vol. X, p. 836.

Page 837. *Orang-utans.* Important information on these animals has been communicated by Mr. James Brooke, respecting those of Borneo, in a letter to the Curator of the Zoological Society, published in the 'Proceedings' of that body for July 13th, 1841. That gentleman has satisfactorily confirmed the deductions of Mr. Owen from certain crania, to the effect that at least two, and there is every reason to suppose three, distinct species exist, all of which inhabit the island of Borneo.

One, the *Mias Kassar*, or *Pithecus Morio* of Owen, is distinguished by its inferior size, by the non-gigantic proportions of its extremities, by the absence of callosities on the cheeks at all ages and in both sexes, by the small size of its teeth, and especially by having no elevated ridge whatever extending backward beyond the frontal bones of the skull. The nearly perfect skeleton of a female Orang in the Society's Museum appertains to this species.

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* It scarcely differs, if at all, from the note of *V. sphenura*, which I have since heard.

† In a letter just received from Mr. Jerdon, that naturalist enquiries whether I have ever obtained the grey-bellied *Vinago*, figured as *militaris* by Gould? Certainly, Gould's species is the common *Hurrial* of Bengal; but I have also obtained one female which I now think is distinct, being probably the *V. militaris* apud Jerdon. This bird has the whole under-parts bright green, but not any of this colour on the basal part of its caudal *rectrices*, and there is also scarcely a trace of red on its lower tail-coverts. Size rather inferior to that of the other. It may bear the specific name of *chlorigaster*.

Another, the huge animal with immense cheek-callosities and gigantic extremities, has the ridges of the skull less elevated than in the next kind, "but the size of the adult skulls is equal;" in this "the ridges rising from the frontal bones do not meet, but converge towards the top of the head, and again diverge towards the posterior portion of the skull." Unfortunately, we have not the cranium of Dr. Abel's Sumatran specimen, the skin of which, as I stated in my former Report, *possesses cheek-callosities* of moderate size; but the skin of the head is mutilated so that it cannot be ascertained whether the frontal ridges meet or not on the vertex, although they are strongly marked on the skin so far as this is perfect. The whole top of the head from the forehead has, in fact, been cut away; and all that we possess of the osteology of this specimen is the lower jaw, which presents a very decided difference of form from the lower jaws of both the others. There appears to be no reason, however, for doubting that this Sumatran animal is perfectly identical with the Bornean *Mias Pappan* of Brooke, or *Pithecus Wurmbii* of Owen; and accordingly the *Pithecus Abelii* (verus) must be reduced to a synonym.

In a third form of skull, "the two ridges, one rising from each frontal bone, join on the top of the head, forming an elevated crest, which runs backward to the cerebral portion of the skull." This Mr. Brooke presumes to be the *Mias Rambi*, a third species distinguished by some of the natives of Borneo, and stated by them "to be as tall as the *Pappan*, or even taller, but not so stout, with longer hair, a smaller face, and no callosities either on the male or female; and they always insisted that it was not the female of the *Pappan*," which is asserted by them to have cheek-callosities, the same as the male. The probability of this being a distinct species is further strengthened by a large adult living female shipped by Mr. Brooke for England; "her colour is dark brown, with black face and hands; and in colour of hair, *contour* and expression, she differs from the male Orangs, with the callosities, to a degree that makes me doubt," writes Mr. Brooke, "her being the female of the same species." A skull of a Bornean specimen according with this description exists in our Museum, being clearly identical in kind with that (also from Borneo) figured in the Zoological Society's 'Transactions,' II, plates XXXI and XXXII; but it is evidently that of a female from its smaller size, the inferior developement of the ridges, and the size of the canines.

In the first Volume of the same work, Professor Owen has described and given two figures of an *alleged* Sumatran Orang's skull, which differs again in certain particulars from the large Bornean specimen figured by him as adverted to. The profile of the face, if I remember rightly, is much more concave; but our library is unfortunately deficient in that *part* of the volume, and I have been unable to get it elsewhere in Calcutta. However, in describing the Bornean specimen, Mr. Owen writes (in Vol. II, p. 168), that —— "The osteological differences relating to the structure and contour of the cranium, [in the Bornean and presumed Sumatran specimens,] have been described in my previous communication on the subject, and I now subjoin figures, of the natural size, of the cranium of an adult male, undoubtedly from Borneo (pl. XXXI and XXXII), a comparison of which with the figure of the (said to be Sumatran) Orang's skull (pl. LIII and LIV, Vol. I, *Trans. Zool. Soc.*), will convey an adequate idea of the osteological difference alluded to." Both have the ridges united along the vertex, as in the last described form mentioned by Mr. Brooke, so that a fourth species of Orang may yet remain to be discovered.

According to M. Isidore St. Hilaire, in the *Zoologie du Voyage de M. Bélanger*, p. 25, Orangs are found in Cochin-China, and the Malay peninsula, as well as in Borneo. He does not mention Sumatra, though quoting Clarke Abel's account, and was unaware of the existence of a plurality of species.

There is now living in Calcutta a young male Orang having incipient cheek-callosities, which consist of merely a thickened fold of skin, which would certainly not be observed unless attention were especially directed to the subject. He has as yet cut none of his *true* molars, and measures sixteen inches from shoulder to ham, and twenty inches from shoulder to tip of longest finger. His gait is decidedly not that of the *Kassar*, as described by Mr. Brooke, nor does that gentleman's account of that of the *Pappan* well apply to it; this animal going on all fours, and (what of course must be considered an individual peculiarity,) I observe that he invariably walkswith one fist closed, bearing however on the wrist, and the other having only the fingers doubled; both hands being turned outward. So far as can be judged from so young an animal, I am inclined to think that the ridges arising from his frontal bones *will meet;* but I would not lay much stress upon this observation: and the only further remark that I need at present make concerning him, is that his posterior thumbs are nail-less, as is most usual.

Page 838. *Gibbons. Hylobates leucogenys*, Ogilby. With reference to my incidental remarks on the habitat of this species, Mr. Jerdon writes me word — "You may rely upon it no real Ape exists in Southern India." Lieut. Beagin's statements were, nevertheless, positive; and he could not well have confounded it with *Semnopithecus Johnii*, as he also favoured me with information concerning that species (vide *Proc. Zool. Soc.*, 1841, p. 60). An undetermined species of Gibbon inhabits Celebes.

Page 839. *Indian Semnotes.* Only two species of the extensive Austral-Asian genus *Semnopithecus* are recognised as inhabitants of Continental India in the most recent work of authority treating on the subject, which is Mr. Martin's 'Natural History of the Mammalia,' unfortunately discontinued (from the failure of the publishers, in 1840,) after the ninth number, which contains an account of the group under consideration. The two species adverted to are:— *S. Entellus*, the common *Hoonuman* of Bengal, understood to be very generally diffused, and not only in the low country, but occasionally ascending even to the verge of the snow-line upon the Himalaya, — and *S. Johnii* (Fischer, vel *cucullatus* of Is. Geoffroy and Lesson), which is confined to the southern parts of the country, "abounding," as Mr. Jerdon informs me, "in the dense woods of the Neilgherries, and in the *forest* on the *sides* of the hills. I have also seen it," he adds, "in the elevated district of the Wynaad, but only near the base of the Neilgherries. It associates as usual in small herds; leaps with amazing agility, and has a loud call very like that of the *Entellus*. The young are perfectly black, with hardly an indication of the light-coloured hair of the hood of the adult. It is more suspicious and wary than the *Entellus*, and never leaves the woods."

The *S. cephalopterus* (vel *latibarbatus, leucoprymnos, fulvogriseus*, et *Nestor*, Auctorum,) is, however, described as peculiar (so far as known) to Ceylon; and in the description of *S. Johnii*, Mr. Martin observes that — "In the Paris Museum a specimen exists, which is here referred, though with some degree of doubt, to the *S. Johnii;* as it differs considerably in the general tone of its colouring, from any of the examples of this species hitherto examined. It is an aged female from Malabar, and is accompanied by its nursling, considered to be her own offspring." The following description is annexed: — "Length of head and body two feet; of tail three feet two inches. The fur resembles that of an adult *Entellus:* the back is of a fuliginous-grey, becoming darker on the shoulders and thighs, and still more so on the arms and legs, where the colour is nearly black; the hands and feet being quite black: the head, whiskers, and beard, which latter is conspicuous, are of a dirty straw-yellow, passing insensibly into the hue of the back; the long eye-brows, and hairs continued from them over the sides of the cheeks, are black, as are also those scattered on the upper lip; the face is black; the tail dark brown, its apical third being much paler; the inside of the humerus, and of the thighs and the under surface of the body, are of a dusky straw-colour. The nursling is covered with close, soft, soot-coloured hairs."

This description closely applies to the fully adult male which I named *S. hypoleucos* in my first Report to the Society, except that the size is larger, and the tail of the Society's specimen is wholly black*: the dirty-whitish hue of the crown, also, is distinctly enough separated from the peculiar colour of the back, which Mr. Martin styles a fuliginous-grey, while in my description I have termed it "a rather deep and somewhat dusky brown, with a tinge of chocolate"; but the truth is, it is by no means an easy tint to express in words, being nearly the same as, but darker than, the duskyish *chocolat-au-lait* tinge more or less developed along the croup of *S. Entellus,* being moreover darkest between the shoulders and upon the middle of the back, and paling considerably on the sides of the back and towards the rump: the Society's specimen is also probably of a less deeply sullied white underneath than that described by the author quoted, though sufficiently tinged with straw-yellow to render the specific appellation which I have bestowed on it not particularly appropriate.

Feeling no doubt, accordingly, that the Society's specimen is identical in species with that in the Paris Museum, the more especially as the latter was received from Malabar, whilst at Madras I learned that the Society's animal was there known as the Travancore Monkey, I cannot but express surprize that so experienced a student of Mammalia as my friend Mr. Martin is, should have hesitated at all about recognising this as a distinct species from the *S. Johnii,* from which (independently of colour) it conspicuously differs in having the hair of the whiskers and back of the head not remarkably lengthened, and in having the same radiating centre on the forehead as the *S. Entellus;* the crown is, however, more densely clad, and with longer hair, than in the *Entellus,* which is not similarly appressed; but, in general characters, this species closely approximates the *Entellus,* much more than it does the *Johnii,* and with the next would appear to form with it a slight minimum subdivision of the genus, apparently peculiar to Continental India.

Of its habits, Mr. Jerdon writes me word, "The black-armed species is peculiar to the dense forest of the Western Coast. It abounds at the *base* of the Neilgherries in Malabar, Travancore, &c., lives in *small* troops, and has the usual loud cry of the others of this genus. The true *Entellus,* I have found chiefly in the neighbourhood of large towns, frequenting *groves;* also however in forest in Goomsoor, and open jungle in the Deccan. It is a much larger kind than the other."

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* The colour of the tail varies much in *S. Entellus.*

Mr. Hodgson, in *J. A. S.* IX, 1212, has described the *Lungoor* of Nepâl as a particular species, by the specific designation *schistaceus:* it would certainly appear, from his description, to be distinct from the Bengal Hoonuman, both exceeding it in size, and differing from any of its varieties observed by me, in colour; and as the description furnished by that naturalist is brief, I shall here republish it, and then remark wherein it would appear to differ from the Entellus.

" Habit of *Maurus:* dark slaty above, below and the entire head, pale yellow; mere hands and feet somewhat darkened or concolorous with the body above; a pencil of black hairs radiating upwards from the brows, concolorous; tail longer than the body, more or less tufted; skin black, nude on face, and on last phalanges of anterior digits; hair on the crown short and radiated, on the cheeks long, directed back, and hiding the ears; piles or fur of one sort, not harsh, nor soft, more or less wavy, three to five inches and a half long on the body, closer and shorter on the tapered tail: thirty inches long; tail without the hair thirty-six; hand six and a half; foot eight and a half. Females smaller, with shorter canines. Habitat, the Tarai forest and lower hills [of Nepâl], rarely the Kachâr also."

Of the *Entellus* of the Southern Mahratta country, Mr. Elliot states, " An adult male measured, from muzzle to insertion of tail, one foot ten inches and a half; length of tail alone three feet two inches and a half; height from heel to crown three feet two inches and a half; weight twenty-two lbs.: ditto of an adult female eighteen lbs." Mr. Martin gives the admeasurements of the adult male, as two feet two inches from head to root of tail, the latter with hair three feet one inch. In an excursion which I made for the express purpose of observing and collecting some specimens of the Hoonuman of Lower Bengal, I procured a fine adult, but not old, male, and a much older, though still not past offspring-bearing, female, besides younger individuals; and I have since obtained other adults. The male measured twenty-four inches from crown to base of tail, the latter without hair thirty-eight inches, being mutilated of its extremity: the corresponding dimensions of the female were twenty-two inches and thirty-nine inches, the slight tuft at the end of the tail reaching to four inches more: hand of the male five inches and three-quarters (or measuring to the extremity of the naked space inside the wrist, nearly six inches and a half); of the female five inches and a half: foot of the male eight inches and a quarter, and of the female seven inches and five-eighths. These admeasurements were taken from the recent animals. The male here noticed has its permanent series of teeth complete, but quite unworn; whereas the female has its grinders worn down almost to the gums, and its canines to a level with the incisors, shewing a transverse section of their structure: how the latter should be thus worn away remains to be ascertained. The male was killed in the act of feeding on the pods of a common species of *Dolichos*, and the same appeared to constitute the contents of the stomachs of the others shot on the same occasion, so far as could be made out, and especially from the pale green colour of the thoroughly well masticated mass. This was at the end of January, and one I killed towards the close of July had been feeding on some kind of foliage, thus verifying the suggestion of Prof. Owen regarding the natural diet of this genus of Monkeys.

The female specimen here noticed is the darkest-coloured individual of *S. Entellus* I have ever seen, while the male is nearly identical in colour with the young (which do not appear to vary, at least more than in a very trifling degree); but his hands and feet are *wholly deep black*, as are likewise those of the female (the feet of the latter having some pale hairs intermixed), and as has equally been the case with all the adults I have noticed: whereas this black is much less strongly marked in the young, but is constantly present in different stages of development. Now Mr. Hodgson's *schistaceus* is stated by him to have the mere hands and feet *somewhat darkened, or concolorous with the body above;*" and the hue of the upper-parts is described to be "dark slaty," a term which could never have been applied even to the remarkably deep-coloured female *Entellus* now before me. On the other hand, this black does not in the least ascend the limbs of the latter specimen, wherein it conspicuously differs from *S. hypoleucos.* The hair on the cheeks of *schistaceus* is described to be "long, directed back, and hiding the ears," which last is certainly not the case in *Entellus;* and that of the body is mentioned to be "three to five and a half inches long," though it is possible that the word *five* has been here printed for the figure 3, in which case there would be no difference in this respect. The diversities indicated, however, are quite sufficient to warrant our pausing, for further evidence, before following authors in identifying the *Lungoor* of the Himalaya with the *Hoonuman* of the plains (at all events of Bengal), and the current statements, therefore, regarding the geographic range of the latter must, for the present, remain in abeyance.*

Should the *Lungoor* prove distinct, no less than five species would accordingly represent this genus in the *Fauna Indica:* viz. *schistaceus* on the Himalaya, though, by the way, Mr. Hodgson describes this animal to frequent "the Tarai forest and lower hills, rarely the Kachâr also," of Nepâl, and it may be presumed that the Bootan species, and the alleged *Entellus* Monkey of other elevated regions of the Himalaya, will prove identical;—*Entellus* in Bengal, being probably that of the Indian peninsula generally;—*hypoleucos* and *Johnii* in the hilly regions of the South; — and *cephalopterus* in Ceylon.†

To resume my notice of the true *Entellus,* I observe that Mr. Martin asserts that — "In young individuals, the hands and feet are washed with dusky-black, *but this,*" he adds, "*is not always the case in adults,* which have a paler colouring altogether than the young, often verging upon dingy-white, tinged with straw-colour." This is opposed to what I have observed of those of Lower Bengal. Considerable numbers of the young may often be seen together in the shops of the Calcutta dealers, being all of one size and colour at any given time, and when about a quarter grown they may be described as having the head (except where naked), and the under-parts generally, much paler than the back, the hue of which is best expressed by the term — a light dingy isabella-colour; tail somewhat darker, its terminal third pale in some, while others have the whole tail pale; limbs slightly washed with greyish chiefly below the elbow and knee, and the fore-arm somewhat darker; the hands and feet nigrescent, more developed on the former than on the latter. The palest *adult* male that I have met with only differs in having these colours more distinctly brought out, and consequently contrasting, the entire hands and feet being conspicuously deep black, and a large lengthened space on the croup (scarcely traceable in the small young), being of a light chocolate-brown differing from the rest. A nearly half-grown young specimen has the shoulders, sides, humeri, and greater part of the thighs, of the same very pale colour as the head, and the moderately dark croup-patch well developed and strongly contrasting: another of the same size merely differs in having the croup-patch less defined, and spreading faintly over the shoulders and humeri; the blackish on the hands and feet increasing in intensity. Finally, the dark female (which, it may again be noticed, is much older than the male, having her teeth worn down to stumps, whereas those of the male already described, as also those of another male nearly as dark as the female, are quite entire, though I nevertheless have reason to suspect that these animals become darker with age,) has merely the colours generally much darkened, the hue of the croup spreading, but less deeply than on that part, over nearly the whole upper (or rather hinder) parts, being nearly identical with that of the fore-arm and leg, which are in part as dark as the croup itself; tail still darker for three-quarters of its length, but then paling to the tip; and the hair of the under-parts below the nipples deeply and very conspicuously tinged with orange-brown; hands and feet black (*i. e.* the hair of their upper surface as well as the palms and soles), as described. The visage of the male is much larger, with the muzzle more protruding, than in the other sex; the pair having a strongly characterized masculine and feminine expression.

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* Mr. Fraser, in his "Notes on the hills at the foot of the Himala mountains" (Journal of Tour in do., p. 350), mentions "a long-tailed Ape of a *dark* brown colour, and considerable size," as common. The expression *dark brown* will certainly not apply to the Bengal Hoonuman. I have shown our specimens of the latter to several gentlemen familiar with the *Lungoor* of the Himalaya, and the usual impression was, that they are different; but Dr. Falconer (a host in himself) is reluctant to consider them as distinct, although he, in common with most others, remarked at once the blackness of the hands and feet, as one difference from the Lungoor.

† A sort of *out-burst* of new species of mammalia, described or semi-described by Mr. J. E. Gray, of the British Museum, in the 'Annals and Magazine of Natural History' for December, 1842, has just reached me, wherein is assigned to *India* (Qy. Hindoostan?) a *Presbytis nobilis* (this very trivial subdivision being merged in *Semnopithecus* by most authors). It is described as "bright rufous, without any streak on the shoulders.—This species differs from the *Simia melalophos* of Raffles in being darker, and not having a black crest; from *P. flavimanus* in being of a nearly uniform auburn, and not yellow, with a blackish back, and in having no black streak across the shoulders or on the cheek." p. 256.

From a passage in Moor's *Hindu Pantheon* (p. 320), it would seem that the Hoonuman has not unfrequently twin offspring; that author mentioning their scampering over the fields and hedges, when put to rout by the appearance of a stranger, "some with a young one under the arm, and a second clinging to the neck. The most numerous hordes of Monkeys," he continues, "that I ever saw were on the banks of the Jyghur river, between Bombay and Goa. In Guzerat, Apes [Monkeys] abound." The Hoonuman always descends from the trees upon alarm, at least where the ground is sufficiently open for them to make their way upon it (and I doubt whether they are elsewhere met with), and it should perhaps be added when no four-footed enemy awaits them there, from the pursuit of which they are secure above. The Tiger is known to make a frequent prey of them, and I imagine more commonly pounces on them when on the ground, than avails himself of the stratagem mentioned by Dr. Fryer and Mr. Forbes.* Upon the approach of a human stranger, in European dress, they certainly always trust to their speed on the ground for security, and it is a beautiful sight to observe them fast scampering away, with the tail raised to curve over the back; they seek to hide themselves in thick bushes, or more commonly upon trees which have sufficiently dense foliage for the purpose, but which are not too thick for them to observe what is going forward around; the bamboo and the tamarind tree, are thus particularly selected, but not the mango which is too dense; and when a quick eye has discerned one couched within the foliage, or peering from behind a fork of the timber, of perhaps some isolated tree, away it will suddenly rush in the finest imaginable style to the ground through the branches, and make off with a rapidity which few marksmen could depend on checking. There are not many places, however, as is well known, where the Hoonuman can be shot at with impunity; but I know of one within a moderate distance of Calcutta, where the natives render every aid to the gunner who will help to rid them of these troublesome neighbours: another tide up the river, and we arrive at Gouptipara,* the scene of M. Duvaucel's anecdote of one these Monkeys; and there, as in his time, the Hoonumans are strictly protected. That accomplished naturalist remarks that the appearance of this species in Lower Bengal takes place principally towards the latter end of winter; upon which Mr. Martin notes, that it appears to migrate from the upper to the lower provinces of this part of India. I can only state that I have found them equally numerous in July and January in the particular locality adverted to, and that I have seen them in June close to Calcutta on the opposite side of the river. With respect to the alleged migration of the Himalaya species (?), also, Capt. Hutton mentions, that—"This species is found at Simla all the year through, but when the snow falls during the winter it seeks a warmer climate, in the depth of the *Khads*, returning again to the heights as it melts away. I have seen them, however, on a fine sunshiny day even with the snow on the ground, leaping from tree to tree up and down the hill of *Jakú* at Simla, which is 8115 feet. Royle," continues this observer, "is mistaken when he says, that the Entellus alone ascends in the summer months as high as 9000 feet! I have seen them at *Nágkunda* in August at 9000 feet, and in winter on *Háttú* mountain which is 10,655 feet; and in winter at Simla with snow four or five inches deep and hard frosts at night, as high as 8000 feet." The *Macacus Rhesus*, also, was seen by this observer "repeatedly during the month of February when the snow was five or six inches deep at Simla, roosting (?) in the trees at night, on the side of *Jakú*, and apparently regardless of the cold." *J. A. S.* VI, 934-5.

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* *Vide* Forbes's 'Oriental Memoirs.'

I know of one locality where the whole numerous community of Bengal Hoonumans appears to consist of males only, of different ages from half grown or less to adults; and the natives of that part say that furious battles are frequent among them: whereas the great majority are females in the other locality that has been spoken of, and it is understood that each male attached to a flock of females allows no other male, even half-grown, to approach them. Though a stream navigable for boats passes through the jungle inhabited by the latter community, or probably series of communities, with plenty of Hoonumans on each side of it, the natives of the place informed me that they had never known one to pass across, or in fact to enter the water.

S. pileatus, Nobis. n. s. ? Cercopithecus albocinereus ?, Desmarest. A particularly handsome (half-grown) specimen of an animal of this genus has been received by the Society from Barrackpore, stated to be Malayan, but which I cannot identify with any of those described by Mr. Martin. It most nearly accords with M. Desmarest's description of his *Cercopithecus albocinereus*, as rendered by Mr. Martin in his account of *S. comatus;* one exception being, that the ears of the latter are stated to be "large, naked, angular, and black," whereas in the specimen before me they are proportionally smaller than in the *Entellus*, and their duplicature above is well clad with whitish hairs. The general aspect of this animal recals to mind that of a Lemur: having the fur softer, longer, and more dense than in the *Entellus*, and the tail well clad and distinctly tufted at its extremity; there is no radiating centre, nor vertically raised crest, upon the head, and the fur of the occiput is rather short (wherein it decidedly differs from *S. obscurus);* but the usual superciliary black hairs are of considerable length, and behind these the fur of the forehead is rather short and directed backward, being mingled with longer black hairs on the sinciput directed laterally, while those of the crown also are a little lengthened and stand out behind, overhanging the occiput, thus imparting somewhat the appearance of a small flat cap laid upon the top of the head; there are also a few scanty fine black hairs on the sides of the face and of the upper lip. General colour a delicate soft grey, rather darker on the upper part of the back, and slightly inclining to albescent on the arm, fore-arm, and leg; tail a little sullied with yellowish brown, and darker towards its extremity, which is of a dusky-brownish hue: sides of the crown blackish, chiefly from the intermixture of the laterally disposed fine black hairs already mentioned; the forehead somewhat pale; face black as usual; the hair of the cheeks whitish and strongly contrasting, being considerably lengthened laterally and posteriorly, so as to hide the lower part of the ear, behind which is also some similar long and glistening whitish hair continued from beneath; scanty beard also whitish; and the whole of the lower parts and inside of the limbs dull fulvous-white: the hands have a slight blackish stain, except on the penultimate phalanges of the digits, and the feet have a similar stain on the first or basal phalanges only; hence the adult animal would perhaps have the hands and feet black, as in the true *Entellus*, or partly so. The specimen described is a female; and, should it prove new, the species might be appropriately termed *S. pileatus.* I may add, that the skin is everywhere of a light colour, except on the naked parts. The dimensions of the recent animal were—from vertex to tail eighteen inches, the tail twenty-eight inches and a half, or with its terminal tuft thirty-one inches; length of humerus six inches, of fore-arm the same, and of hand four inches and a quarter; femur seven inches and a half, tibia seven and three quarters, and foot from heel six inches and a quarter. Irides rather pale brown.

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* Not *Goalpara*, as Mr. Ogilby surmises; but *Gouptipara*, as Mr. Duvaucel spelt it, and as it is also spelt in the maps, — a place on the right bank of the Hoogly, opposite Santipore.

I strongly incline to suspect that this handsome Monkey is of the species termed *albocinereus* by M. Desmarest, of which he states that it is "a new species (not figured), from the collection preserved in the [Paris] Museum, and brought by M. M. Diard and Duvaucel. Country, the Island of Sumatra." M. Isidore St. Hilaire, however, according to Mr. Martin, states that "no such animal was ever brought from India [the East] by M.M. Diard and Duvaucel, answering to Desmarest's description, nor does any specimen agreeing with it, exist in the Museum of Paris. During the author's [Mr. Martin's] recent visit to Paris, he examined, separately, every Monkey in the Museum, and, certainly, could discover no species to which the description could be said to be fairly applicable. Moreover, every specimen brought from Java or Sumatra, and obtained there by M. M. Diard and Duvaucel, is well known, and the species are not to be mistaken." There is accordingly no means of determining, with certainty, whether the animal here described is identical in species with that of M. Desmarest, but the probability is certainly in favour of the identification.

At present, we are really quite ignorant of what species of Monkeys inhabit the countries bordering on the Bay of Bengal to the eastward. The *Semnopithecus obscurus* (Reid, *P. Z. S.* 1837, p. 14,) has recently been discovered by Mr. Cuming to be very common at Singapore, " varying greatly in the depth of its colouring, no two specimens being precisely the same. The general hue ranges from greyish-black, or smoke-grey, to black; the [lengthened] occipital crest and the tail being always paler than the rest." And as the *Hylobates Lar*, previously known only as an inhabitant of the Malay peninsula, has been received by this Society from Moulmain, where it is most probably the common species of the interior adverted to by Helfer, it is likely that *Semnopithecus obscurus* extends its range similarly northward, and that it is the *maurus* of Dr. Helfer's list, mentioned as " a very wild inhabitant of the loftiest trees, and considered the best food by the Kareans, who shoot it with poisoned arrows." The true *maurus* appears to be confined to Java, being replaced in Sumatra by *femoralis*—the doubtfully cited *maurus* of Sir Stamford Raffles.

P. 840. Returning now to my first Report, in the page cited I have mentioned specimens of *Pteropus Edwardsii* vel *medius* from the vicinity of Madras and from Travancore, the latter with a note of doubt which may now be cancelled, as I have obtained the same variety of colour here, as well as intermediate specimens; and Mr. Hodgson has also forwarded specimens of his *Pteropus leucocephalus* and *Pt. pyrivorus* from Nepâl (vide *J. A. S.* IV: 700), the former being (as already asserted by Mr. Ogilby) perfectly identical with *Edwardsii*, and the latter is *Pachysoma marginatum*, also common here. A third species of Indian frugivorous Bat, the *Pt. Dussumieri*, Is. Geoff. (*Zoologie du Voyage de M. Bélanger, p.* 89), is still wanting to our collection. Length about eight inches, and extent nearly two feet and a half. Face and throat brown; the back and belly covered with brown hairs having some whitish ones intermixed; the upper part of the breast russet-brown; and sides of the neck, from the ears to the insertion of the wings, fulvous with a shade of russet. Specimens of this Bat were obtained " on the Continent of India" by M. Dussumier, and recently by Dr. Royle near Saharunpore. The *Pt. Javanicus* occurs in the Tenasserim provinces, and a new species has been described by Dr. McClelland from Assam, as *Pt. Assamensis*, *P. Z. S.* 1839, p. 148.

Taphozous. For descriptions of four Indian species of this genus of Bats, vide X, 971, and XI, 784.

The Reptile cited as *Varanus binotatus* is my *V. Bibroni*, XI, 869.

P. 841. *Hæmatornis pusillus*, Nobis, or *Ixos pusillus*. This distinct species appears to fill the place, in the peninsula of India, of *I. Cafer* of Bengal and Nepâl, which latter was unknown to Mr. Jerdon who so designated the other. It also inhabits Arracan.

P. 922. The two races of *Buceros ruficollis* noticed, as inhabiting the Tenasserim provinces, have proved to be distinct species; of which the true *B. ruficollis*, Vieillot, is distinguished by its superior size, the flatness of its casque, and the lateral transverse ridges on the basal portion of the bill itself; these last being constantly wanting in the other, which has likewise the casque much more elevate or convex. In my Report to Government on a collection of Tenasserim specimens forwarded by the late Dr.

Helfer, I have designated the latter species of Hornbill — *B. subruficollis*; the two present no difference in plumage.

B. leucogaster, Nobis, is identical with *B. albirostris*, Shaw, erroneously identified by Mr. Jerdon with *B. Malabaricus*, which is *B. monoceros*, Shaw. The latter appears to be restricted to Hindoostan and Ceylon, being replaced in Bengal, Assam, and the Tenasserim provinces, by the present nearly allied species, which differs in being smaller, in having the casque much less compressed, the black mark on this being also differently placed, and especially in the colouring of the tail, *B. Malabaricus* having the three exterior *rectrices* wholly white, and the next chiefly so, while in *B. albirostris* they are only tipped with white. The specimen of the latter described as *B. leucogaster*, was immature.

P. 923. The *Oxylophus* described is *O. Coromandus.*

Phœnicophæus longicaudatus, Nobis, is the *Melias tristis* of Lesson; whilst my *Ph. tristis* described in the Monograph of Cuckoos (XI, 928), would appear to be his *M. Diardi*, a specific name, however, which yields precedence to *Sumatranus* of Raffles. These and other emendations and additions to my paper on *Cuculidæ* have been put together as an appendix to that Monograph, which is awaiting publication.

P. 924. *Ianthocincla leucolophos? var.*, is the *Garrulax Belangeri* of Lesson.

Muscipeta Indica vel *castanea* becomes, with full maturity, *M. paradisea; vide* XI, 884.

P. 925. *Ciconia nudifrons*, Jerdon, should be *C. nudifrons*, McClelland, and *C. calva*, Jerdon; *C. immigratoria*, Hodgson; and I much suspect *C. Javanica*, Horsfield, vel *C. capillata*, Temminck. It is common about Calcutta, where the only additional species of 'Adjutant' is the great *C. argala:* besides these, there are the *C. nudifrons*, Jerdon (not of McClelland), in the Indian peninsula, and the *C. cristata*, McClelland, in Assam; also, in the latter country, I am told that there is an 'Adjutant' with a black breast.

P. 917. For *Anthus rufescens?* read *A. agilis;* and for *Motacilla alba*, *M. leucopsis*, Gould, vel *alboides*, Hodgson, — long ago figured by Sonnerat.

Tadorna Bellonii. Not very uncommon.

Vol. XI, p. 95. I may here anticipate the publication of my paper on Indian Moles (*Talpa*), which is awaiting the arrival of some Assamese specimens for examination and comparison, by mentioning that the Sylhet species is very different from those of Nepâl and Darjeling, which latter differ, the Nepâlese (*T. micrura*, Hodgson,) in having a short but very distinct tail, whilst the latter (*T. cryptura*, Nobis,) has only the merest rudiment of this appendage, as shewn by two specimens of this last in the Society's Museum, one of them being in spirits. The Assamese species appears to be at least allied, if not identical, with that of Sylhet.*

P. 98. The species of Weasel noticed by the provisional name *humeralis*, I have since been induced to suspect is identical with *Putorius Subhemachelanus*, Hodgson, *J. A. S.* VI, 564, as already mentioned in a note to XI, 280.

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* I have just received a letter from Major Jenkins, Political Agent in Assam, announcing that he has forwarded a specimen of the Assamese Mole in spirits, in obliging compliance with my request of him.—This has since arrived, and appears (so far as can be judged from its external characters) be identical with *T. micrura* of Nepâl; so that there are two distinct species of this genus in Assam.

P. 100. When tracing the geographic range of the common Jungle Cat of Bengal (*Felis chaus*), I strangely did not think of referring to Mr. Elliot's valuable list of the species of Mammalia inhabiting the Southern Mahratta country (*Madr. Jl.*, No. XXIV, p. 108), or I should have been there informed of its occurrence in Southern India. The *F. viverrinus* has lately been obtained by me in the vicinity of Calcutta.

P. 102. To the species of oriental Hare adverted to, add the Tibetan *Lepus pallipes*, Hodgson, p. 288 *seq.*, and the Tartarian *L. tolai*, Pallas. *L. ruficaudatus* is stated, in the *Zoologie du Voyage de M. Bélanger* (p. 157), to have been "discovered in Bengal by M. Duvaucel. It likewise exists in the neighbourhood of Pondicherry," continues M. Isidore St. Hilaire, "and in various other parts of India. Lastly, it has more recently been met with in the Isle of France, by M. M. Quoy and Gaymard." This Society has lately received the other Indian species (*L. nigricollis*) from the Isle of France, and this alone is mentioned to exist there in M. J. Desjardins' list of the mammalia of that island, in *Proc. Zool. Soc.* for 1831, p. 46.* The European *L. timidus* is mentioned, in addition to *L. ruficaudatus* and *L.* (vel potiús *Arctomys?*) *hispidus*, in Dr. Walker's catalogue of the mammalia of Assam, published in McClelland's Journal, No. X, p. 367: but should this introduction of it repose solely on the authority of the notice referred to this species in *Proc. Zool. Soc.* for 1839, p. 152, then I think we might infer that it may be safely withdrawn from the list of Assamese mammalia, as there can be little doubt of that notice referring to *L. ruficaudatus*. In a catalogue which I have received of a collection of British specimens, for the Society's Museum, which are now on their voyage to this country and may shortly be expected, it appears that examples have been sent of the four species of *Lepus* found in the British islands, which will afford the means of comparing Assamese specimens of reputed *L. timidus* with the animal of Europe.

P. 105. *Picus sultaneus*, Hodgson; vide p. 970: in reference to which Mr. Jerdon suggests, with much probability, that Dr. Horsfield's alleged female of *P. strictus* must have been a young male of that species.

P. 106. To the list of Indian species referred to Mr. Hodgson's genus *Chaitaris*, add the *Muscicapa banyumas*, Horsfield (vel *M. hyacintha*, Tem. apud Tickell, *J. A. S.* II, 574), which is closely allied to *Ch. rubeculoides* — the *Phœnicura rubeculoides*, Vigors and Gould. Mr. Hodgson has also forwarded to the Society a *Ch. auricularis*, a figure of which occurs among Dr. McClelland's drawings of Assamese birds. *M. cantatrix*, Temminck, is identified by Dr. Horsfield and others with *M. banyumas*; and the *M. rubecula*, Swainson, apud Jerdon (*Supplement*), is now suspected by that naturalist to be merely the female or young male of *banyumas*, "so that the label in the French Museum, as quoted by Swainson, may not be so erroneous as he imagines." The *Muscicapa aurea*, Auct., would also appear to be no other than *banyumas*.†

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* I fancy there must be some misconception here, on the Part of M. Is. Geoffroy. The Pondicherry species (*nigricollis*) inhabits the Mauritius, having doubtless been introduced there; but I much doubt whether the other (or *ruficaudatus*) occurs in Southern India at all. The "Indian Hare" may have been brought by M. M. Quoy and Gaymard from the Isle of France, being the Pondicherry species — *L. nigricollis*, and not *L. ruficaudatus*.

† Thus extended, indeed, the genus will bear further separation: *Chaitaris* comprising *Ch. grandis*, *Ch. sundara*, *Ch. McGregorii*, and *Ch. auricularis*; whilst the (*aurea?* vel.) *banyumas*, the *rubeculoides*, and the *Saxicola nigrorufa*, Jerdon, constitute another small group more nearly allied to the Flycatchers.

P. 110. The *Icthyaëtus cultrunguis*, Nobis, proves to be merely the young of *Haliaëtus blagrus*, which is not an uncommon species in Lower Bengal. *H. plumbeus* of Hodgson (referred to) is identical with *Icthyaetus Horsfieldi*, likewise here met with.

P. 112. *Numida maculipennis!*, Swainson. A domestic example of this redoubtable alleged *species* is now in the Museum.

P. 113. I have here given a list of the wading birds of the families *Scolopacidæ*, *Charadriadæ*, and *Rallidæ* of Vigors, and also of the *Anatidæ* and the Grebes, which I had obtained in the Calcutta bazar up to the time of writing; and now, with another year's experience, I have little to add to my former catalogue, and few modifications thereof to offer.

Totanus ochropus and *T. hypoleucos* I have since met with, but neither is common, the former usually occurring in pairs, the latter in small flocks. *Tringa platyrhyncha*, of which I saw and obtained but one specimen throughout the preceding season, has been tolerably common during the last. *T. Temminckii* is chiefly brought about the commencement and close of the season, two or three specimens frequently occurring among the heaps of *T. minuta*, and occasionally greater numbers, even as many as three or four dozen together; yet out of this multitude, the collector may fail to obtain a single specimen fit for preservation, from the vexatious habit most of the dealers will persist in of partially plucking every bird they bring, despite all that can be said to them, and thus ruining many ornithological desiderata; it is thus that I have been unable to get fine summer-plumage specimens of this bird, though many were brought.* *Terekia [illegible]nica* (vel *orientalis*) is rare, as I saw but a single specimen during the preceding season, and two only in the course of the following one. *Scolopax heterura* is seldom brought except about the beginning and end of the cool season, when it is numerous. *Rhynchea Capensis* breeds here. *Squatarola cinerea* should not have been termed common, as it is rather unfrequent (I obtained extremely fine summer-plumage specimens in May, and also of *Tringa subarquata*, the latter being numerous); Mr. Jerdon has lately obtained *Sq. cinerea* in Southern India. The "larger species of Ring Plover," mentioned in my list, comprised two very similar species which I will notice presently. I have recently obtained a pair, separately, of *Ch. Cantianus*. *Pluvianus Goensis* is common: *Pl. bilobus* rare: *Pl. cinereus*, Nobis (*J. A. S.* XI, 587), has now and then occurred during the past season: and the undetermined species, with powerfully spurred wings, mentioned in a note, proves to be the Australian *Pl. lobatus* (v. *Lobivanellus lobatus*, Gould, and *Vanellus gallinaceus* of Jardine and Selby's 'Illustrations,' agreeing with the figure by the latter authors in the degree of developement of the naked skin of the forehead, which is much less than is represented by the former naturalist); it is not Indian: two other species which are so, and have not yet been obtained by me, are *Pl. ventralis* figured by Hardwicke and Gray, and *Pl. spinosus?* the *Black-sided Sandpiper*, Latham, also figured by Hardwicke and Gray.† *Œdicnemus crepitans* — I have obtained one specimen. *Parra Sinensis* in breeding plumage is common during the rainy season. To the list of ***Rallidæ*** may be added ***Gallinula lugubris***, Horsfield, and ***Rallus (?) rufescens***, Jerdon: but I have scarcely obtained any examples of this group during the past season, as no ***shikaree*** has regularly brought them; whereas formerly one came daily with a cageful of ***Porzana maruetta*** and ***P. Bailloni***, with occasionally other species, as ***P. rubiginosa***, ***Rallus aquaticus*** and ***R. Javanicus***, &c. For remarks on the Indian species currently referred to ***Gal[illegible]ula chloropus***, vide p. 887: it is distinct from the European ***chloropus***, of which I have lately seen a specimen killed in the Mauritius; being inferior in size, with constantly a much less developed frontal shield: hence I propose that it should be termed *G. parvifrons:* Mr. Jerdon informs me, however, that he thinks he has lately obtained the true ***chloropus***, additional to the smaller species, in Southern India.

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* Mr. Jerdon has once obtained *Tr. Canutus* near Madras, which he has sent to this Museum, and recently, as he writes, *Tr. alpina*. Both may be presumed to be very rare.

† For a natural arrangement of the Plover group, by Mr. Strickland, where for the first time the respective value of the characters derived from the presence or absence of a back toe, and the form of the wings and general character of the plumage, are duly recognised, vide *Proc. Zool. Soc.* 1841, p. 32.

The specimens of ***Podiceps cristatus*** formerly mentioned, I have since ascertained to have been from the Cape of Good Hope; and up to the present time have only obtained *P. minor*, which is abundant.

Of *Anatidæ*, there have been no additional species: and the only remark I have to make is that *Fuligula nyroca* has been far from plentiful last season, whereas in the preceding one it was particularly abundant. *A. boschas* has never occurred, though so many of the common British species are at least equally numerous in this neighbourhood.

In the Society's Museum is a specimen, received from the Cape of Good Hope, of the *Fuligula mariloides* lately characterized in Mr. Yarrell's 'History of British Birds.' Being well acquainted with *F. marila*, though the Museum does not co[illegible] a specimen of it, I never could assign the present bird to that common British species, and it remained unlabelled till the arrival of the number of Mr. Yarrell's work containing the figure and description of *F. mariloides.* The Society's bird is, however, considerably less bright in colour than that described by Mr. Yarrell, being probably a young male. Head and neck as in the description referred to, but the crown much darker, or glossy reddish-dusky, passing as a line down the back of the neck; lower part of the neck and sides of the breast dusky, the middle of the latter dark brownish, becoming gradually paler on the belly; sides a little speckled, and the feathers margined with light rusty-brown; whole upper-parts dusky-brown; interscapularies margined with pale brown, and all minutely speckled with the same; wings brownish-dusky, a little speckled anteriorly, the coverts of the secondaries white at base, forming the speculum, and tipped with dusky; most of the tail-feathers margined with dull whitish; and a light colcothar tint upon the flanks: length of the closed wing eight inches and three-quarters; of the bill to forehead an inch and three-quarters. I can feel no doubt of the specific identification.

The two very similar species of Ring Plover must now be reverted to, the description of which has been postponed (p. 179).

Charadrius Geoffroyi (?), Wagler. For this presumed identification I am indebted to Mr. Jerdon. Length eight inches and a half to eight and three-quarters, by seventeen and a quarter to eighteen inches in extent; wing from bend five inches and a quarter to five and five-eighths; and tail an inch and seven-eighths to two inches: bill to forehead an inch; and tarse an inch and a half. Winter plumage greyish-brown on the upper-parts, ear-coverts and beneath the eye, and sides of the breast; the rest of the under-parts, with the feathers immediately above the bill, and a streak over the eye, white; primaries darker, and the secondaries partly white on their outer web. Bill wholly blackish; legs pale greyish-green, the toes darker. In summer dress, the forehead, lores, ear-coverts, and beneath the eye, are black, having a white mark on each side of the forehead; the neck and breast are bright rufous, contrasting with the pure white throat; the head is deeply tinged with rufous, more or less; and the back and especially the scapularies are partially margined with the same. This bird is much less common than the next, and I have only now and then found one among the heaps of the other species in the bazar: Mr. Jerdon has recently met with both in Southern India; and the Society has received both species from Mr. Hodgson of Nepâl. *Ch. Geoffrôyi* is described by Wagler from Pondicherry.

Ch. Leschenaultii (?), Lesson, *Man. d'Orn.*, II, 232. *Ch. griseus (?)*, *Mus. de Paris*. For these presumed identifications I am also indebted to Mr. Jerdon. Precisely similar both in summer and winter plumage to the preceding species, but considerably inferior in size, with a proportionably smaller and rather differently shaped bill. Length seven inches and a quarter, by fifteen and three quarters in extent; wing five inches, tail an inch and seven eighths, bill to forehead three quarters of an inch, and tarse an inch and a quarter. Irides blackish, as in the other; legs more or less plumbeous, the toes darker. The young have the scapularies and wing-coverts, and the feathers of the back more slightly, margined with pale fulvous, and a distinct tinge of the same upon the breast. This species is brought in great numbers to the Calcutta bazar throughout the season, but neither it nor the preceding one can be obtained in summer garb before May.

P. 199. *Timalia Horsfieldi*, Jardine and Selby, is identical with *T. hypoleuca*, Franklin, which latter appellation holds precedence. I understand that both this and *T. hyperythra*, Franklin, have recently been figured by M. Guérin in his *Magasin de Zoologie*. The former constitutes Mr. Hodgson's genus *Chrysomma*.

Mirafra Assamensis is not the species assigned doubtfully to *M. Javanica* by Mr. Jerdon; and allied to the latter are two or three in Southern India which I shall leave that gentleman to describe. One, the *Aggun* of the South (*M. cantillans*, Jerdon, *M. S.*), I have also obtained near Calcutta. It is a particularly fine songster.

P. 201. The species assigned by me to *Alauda gulgula*, Franklin, and *A. gracilis*, Nobis, had also better remain in abeyance for the present. The former, however, may be here styled *A. Gangetica*, vide description, *loc. cit.*.

P. 202, and also p. 587. For *Carbo pygmæus* read *Phalacrocorax Javanicus*, which is common in the Hoogly. Indeed, *Ph. Africanus* (stated by Lesson to inhabit India) would seem to be no other.

P. 203. Two species are confounded under the description of *Muscipeta atriceps*, Nobis; the supposed female being my *M. plumosa*, p. 791. The former is nearly allied to *M. Borbonica*, which the Society has since received from the Isle of France, but is larger.

P. 204. The *Prinia pileata*, Nobis, must be referred to *Timalia gularis*, Horsfield, vide p. 794.

P. 455. Genus *Manis*. I have recently had the various Pangolin skins in the Society's Museum relaxed and mounted, when it appeared that the observations of Lieut. Tickell and others respecting the mode of progression of *M. brachyura* do not apply to the genus generally. That species walks pretty much in the manner of the *Myrmecophaga jubata* of South America, on the soles of the hind-feet, while the huge claws of the fore-feet are bent up against the palms, the animal resting not exactly on its knuckles, but on the basal part of its fore-claws. In *M. leptura*, Nobis, *loc. cit.*, however, wherein the claws of the hind-feet are much more developed, it would appear that both fore and hind claws turn inward when the creature walks; and in *M. Javanica* [illegible]ppears very doubtful whether the animal does not walk on the palms of its fore-feet, with the claws straight out in front, as well as on the soles of its hind-feet. At all events, it was found impracticable to double up the fore-feet of the two latter species, as represented in Lieut. Tickell's sketches of *M. brachyura;* whereas two examples of the latter were mounted without difficulty in the attitudes represented by that observer.

P. 456. *Spizaëtus albogularis*, Tickell, has, as I have been informed by Mr. Jerdon, been recently described in M. Guérin's *Magasin de Zoologie* by the name *Asur Kienierii*, received from the Himalaya (?). The latter specific appellation holds precedence.

P. 457. *Strix lugubris*, Tickell; *Ninox Nipalensis*, Hodgson. "Decidedly, I think, the *Noctua hirsuta*, Tem., *Pl. Col.* 239 (289?)". Jerdon. Also *Strix scutulata*, Raffles, *Lin. Trans.* XIII, 280, which name I presume to have the priority.

P. 459. The *Parus Nipalensis*, Hodgson, there described, is the *P. atriceps*, Horsfield, of Mr. Jerdon's catalogue.

P. 460. *Petrocincla Manillensis*, Auct., and *P. pandoo* aut *maal* of Sykes. The birds referred to under these denominations are most puzzling, and I now incline to suspect that these if not four closely allied species will eventually prove to inhabit South-eastern Asia and its islands. In *loc. cit.*, I have described a male from Luçonia, which is unquestionably the *Turdus Manillensis*, Gmelin, while there is every reason to presume that the *T. eremita*, Gmelin, refers to its female, as *Petrocincla maal* of Sykes is the female of his *P. pandoo.* The Society has just received a male and female obtained in the vicinity of Macao, which would seem to be of the same species. In these three specimens the tail is perfectly squared, and both the males have the under-parts from the breast bright ferruginous, each feather more or less tipped with cyaneous, then black, and finally with white: axillaries and under wings-coverts also ferruginous in the Chinese specimen, but the axillaries only in that from Luçonia; and the female from Macao has likewise a conspicuous rufous tinge on the under wing-coverts: tibial feathers cyaneous in both, and a considerable admixture of the same on the posterior flank-feathers The Luçonia bird has its plumage worn, that from Macao recently renewed; but the mottlings were originally somewhat different in the two. In the latter each feather of the upper-parts has a conspicuous subterminal black bar, and is tipped with white on the middle of the back, scapularies and wings, and with greyish-brown on the crown, neck, and fore-part of the back; these mottlings becoming nearly obsolete on the rump: the feathers of the breast are tipped with white, having a subterminal narrow blackish bar, of a semi-circular form or tending a little to be angulated in some. In the Luçonia specimen, these black subterminal bars on the fore-part of the neck and breast are much broader, and of a V-like shape, enclosing a triangular fulvous-white spot; this white being purer and more developed in the other: the feathers of the upper-parts, also, are merely tipped with dingy-brown, retaining some traces of the whitish extreme tips on the lower-part of the back, and more conspicuously on the scapularies and wings. The Chinese female specimen differs so much from the females of *P. pandoo* of peninsular India, that I cannot regard them as identical in species: its differences corresponding with those of the Chinese male. Head and neck dull slaty with brown margins and paler tips, the latter inconspicuous; back and scapularies with subterminal dusky bars and whitish edges; and the dull cyaneous tinge of the upper-parts increasing [illegible] the rump: the entire under-parts are *much paler* than in Indian specimens, being wholly of a dull whitish-fulvous, tinged with rusty on the throat and lower tail-coverts, each feather having two narrow blackish bars, one near the margin, the other central and confined to the vicinity of the shaft. Upon full consideration, I consider the Chinese and Philippine Islands specimens to be of the same species, or *Petrocincla Manillensis* vera

A second species appears to exist in the specimens from the Tenasserim provinces, and to this I refer a fine male from Darjeeling, where the collector lately employed by the Society never obtained more than this one example. Judging from the Darjeeling specimen (for those from Tenasserim have the tail imperfect), it would appear readily distinguishable from *P. Manillensis* by the shape of the tail, which (instead of being squared) has its outermost feathers nearly half an inch shorter than the middle ones. The mottlings of the upper-parts are nearly obsolete, and those of the lower-parts but little more developed; and there would appear to be generally some trace of ferruginous, more or less: in the Darjeeling specimen this is confined to the lateral margins of two or three of the lower tail-coverts; and successively more developed in two from Tenasserim, as formerly described by me. I shall designate this presumed species *P. affinis*.

The third form is the *P. pandoo* of Hindoostan, which would appear to have never any rufous whatever, and has the tail intermediate in shape to those of the two preceding. M. Lesson doubtless refers to this, when he states the *P. Manillensis* to inhabit India; and with the data formerly before me, I cannot wonder that I also referred it to the same.

P. 461. The *Erythrospiza* noticed is certainly the *Gros-bec Rose des Indes*, or *Coccothraustes rosea*, Vieillot, of the *Dict. Class. d'Hist. Nat.*, and is rightly identified as such by Mr. Jerdon, who adds to its synonyms the "*Loxia Madagascariensis* and *L. totta* of English authors": but the *Fringilla rosea*, Latham, is given as a distinct species by M. Drapiez.

P. 462. The specimen referred to *Polyplectron Northiæ* of Hardwicke and Gray is recognised by Mr. Jerdon as the female *Francolinus spadiceus*, to which the former term may accordingly be attached as a synonym. *Vide* descriptions of both sexes in the *Zoologie du Voyage de M. Bélanger*.

P. 463. *Carbo albiventer*, Tickell, or rather *Phalacrocorax albiventer*. The specific name, however, I fear is objectionable, from applying only to the immature plumage of the species, since I incline to identify with it a specimen from Tenasserim in adult plumage, wherein the feathers of the under-parts are only white at base. The colouring of the back in this specimen is nearly as in *Ph. carbo*; the head and neck dull shining black, slightly tinged with greyish-brown; the throat below the gular skin white, passing above the gape and forward to the eye, where it deepens to light brown; the rest of the lower-parts black or blackish slightly glossed; and the feathers at the sides of the throat or lower part of the neck are white nearly to their tips, which are broadly terminated with black, and have a silvery spot above this: beak dusky above, the rest whitish; and gular skin apparently has been yellow. Rare in Central India, and occurs in Assam and in the Tenasserim provinces.*

Ptilinopus purpuratus. It has been suspected that different species are confounded under this name, and certainly the specimen from the Caroline Islands, here noticed, would hardly seem to be identical with that figured by Messrs. Jardine and Selby, *Ill. Orn.* pl. LXX. It agrees more with the description in Shaw's 'Zoology,' XI, 67, which I believe is copied from Temminck, who styles it *Columba kurukuru;* but one marked peculiarity consists in the entire tail being tipped with yellow for three-quarters of an inch, while there is no trace of this colour margining the green portion externally. Crown beautiful purplish-lake, with a slight trace of a yellow margin posteriorly; entire neck, throat, and breast, with the lores and ear-coverts, pale greenish-yellow; scapularies, interscapularies, rump, and upper tail-coverts, a full and tolerably bright green, having a slight cast of aureous; wings and basal portion of tail much finer green, the tertiaries margined with greenish-aureous, and (excepting the largest one) having an amethystine spot, not very bright, within the margin; a purplish patch on the fore-part of the belly, the rest of which is greenish inclining to yellow, and the lower tail-coverts are bright yellow.

P. 465. *Gracula religiosa.* The species here noticed I take to be the *Eulabes Javanus* of Cuvier, which is common in the hilly regions of Bengal, and the Society has received it from Nepâl and Tenasserim. The *Gracula religiosa* of Mr. Jerdon's list is what I presume to be the *Eu. Indicus*, Cuvier. In M. Lesson's *Traité d'Ornithologie*, as I am informed by Mr. Jerdon, *Mainatus Sumatranus*, Lesson = *Eulabes Javanus*, Cuv., and *Gr. religiosa*, Latham and Vieillot; whilst *M. Javanus*, Less.= *Eu. Indicus*, Cuv., *Pastor musicus*, Tem., and also *Gr. religiosa*, Latham. The following are the distinctions of the two species known to me, which I give, as I have seen no satisfactory descriptions of them.

Gr. religiosa, Lin: *Eulabes Javanus* (?), Cuvier; not *Mainatus Javanus* of Lesson, but his *M. Sumatranus.* Distinguished from the other by its superior size, the much greater thickness of the bill, which is also more deeply cleft, the large space covered with short velvety feathers on the sinciput, above which there is no continuation of the naked skin from the occiput, and by the more brightly glossed and separated feathers of the forehead and middle of the head. Length eleven inches and a half by nineteen inches in alar expanse; wing six inches and five-eighths, and tail three inches and a quarter. The bill measures an inch and a quarter to forehead through the feathers, and an inch and a half to gape, being above half an inch in vertical depth; tarsi, measured posteriorly, an inch and one-eighth. Irides dark hazel; bill yellow at the tip, the rest bright coral-red; the bare skin of the head and mobile flaps yellow; and legs orpiment-yellow.

Gr. Indicus: Eulabes Indicus (?), Cuv.; *Pastor musicus*, Tem.; *Mainatus Javanus*, Lesson. Closely allied to the last, but smaller, with the bill and legs less robust, especially the former, and the patch of velvety feathers on the sinciput greatly reduced in size, being bounded above (as well as below) by the naked skin folded into minute lappets. Plumage quite similar. Length ten inches and a quarter by seventeen inches and a half in alar expanse; of wing five inches and three quarters, and tail two inches and seven-eighths. Bill an inch and one-eighth to forehead, and nearly an inch and three-eighths to gape, being only three-eighths of an inch in vertical depth. Its colour inclines to coral-red, or carrotty, with a yellow tip; and the irides, naked skin, and feet, are similar in hue to those of the other. Described from an old cage bird, which was brought to me dead, but in good plumage; and on my suggesting to Mr. Jerdon that this is probably, from the dimensions he has given, his species of Southern India, the anticipation proved to be correct. I am informed, however, that it is likewise found in Bengal, but have never seen one among the many of the other species constantly exposed for sale by the Calcutta bird-dealers.

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* Mr. Jerdon writes me word that he has just obtained it at Nellore.

P. 586. *Garrulax leucogenys*, Nobis. The specimen, as I am now informed, was brought from China; and it is evidently the *Corvus auritus* of the old authors, or *Garrulax auritus*, hodiè; *Spreo auritus*, Lesson. Mr. Frith has favoured me with an interesting notice of the individual, which was excessively tame and familiar, and delighted (like a Cockatoo) in being caressed and tickled by the hand, when it would spread out its wings and assume very singular attitudes. It was naturally a fine songster, and a most universal imitator. Whenever chopped meat or other food was put into its cage, it always evinced the propensity to deposit the bits one by one between the wires (a habit in common with the Shrikes, and which is also strikingly manifested by the *Kitta venatorius*, and sometimes even by Mynahs); and when a bee or wasp was offered, this bird would seize it instantly, and invariably turn its tail round and make the insect sting this several times successively, before eating it. A large beetle it would place before it on the ground, and pierce it with a violent downward stroke of the bill: a small Snake (about a foot long) it treated in like manner, transfixing the centre of the head, and it afterwards devoured about half the Snake, holding it by one foot while it picked it with the bill, as was its common mode of feeding.

Erase *Caprimulgus macrourus*, for the species is distinct, and not of uncommon occurrence in the vicinity of Calcutta during the cool season: besides this, the *C. Asiaticus* is here common at that time (*both sexes* having the white marks on the wings and tail); and I have procured one specimen of *C. monticolus*.

P. 603. The *Megalurus* mentioned was designated *Turdus toklao* by Buchanan Hamilton.

P. 789. *Vide* note. "The small species of Hawk employed in the N. W. provinces for falconry," writes Mr. Jerdon, "is much more likely the male *Accipiter besra* of my catalogue, or *Dhootee* (*i. e.*, a handful), which is used exactly as described; if not, the male *Khandesra*, also called *Dhootee*, a species which I am confident is quite distinct, but which I have not yet procured."

Genus *Ierax*. The Assamese specimen of an *Ierax* mentioned in the same foot-note is distinct from *I. cœrulescens* and new, being the fourth species of this well-defined group of very diminutive Falcons, which are as follow:—

1. *I. melanoleucos*, Nobis. This is the largest of the four, measuring six inches and a half and upwards in length, with a powerful beak of considerable vertical depth. Colour of *I. cœrulescens*, but the white of the under-parts, superciliary line, and neck-spot, pure and unsullied; and what constitute ready distinctions, the tibial

plumes and under tail-coverts are pure white like the rest, and there is no frontal band, as in the others.

2. *I. Bengalensis*. *Little Black and Orange-coloured Indian Hawk* of Edwards. Length about six inches to six and a half, the wing four to four and a half. Throat, belly, thighs, vent, and under tail-coverts, deep ferruginous; breast slightly tinged with the same: superciliary line white and very broad, crossing the forehead, and continued downward to the neck-spot, which is also large and nearly or quite continued across the nape: rest as *I. cœrulescens*. Inhabits Nepâl.

3. *I. cœrulescens*, Auct. Considerably smaller than the two preceding, with the black of the sides continued over the whole outside of the thighs: superciliary line, neck-spot, and belly, often more or less sullied with rufous, and the white of the breast less pure than in the first species Inhabits the Malay countries.

4. *I. erythrogenys*, Vigors, *P. Z. S.* 1831, p. 96. Philippine Islands.

P. 790. "*Ceyx tridactyla*, Lacépede, *Var.*" Is this *C. purpurea*, Lesson, from Pondicherry? The latter can hardly be *C. microsoma*, Burton, *P. Z. S.* 1837, p. 89. "*Hab.* in India Maderespatanâ."

P. 797. *Anthus Malayensis*; *vide* p. 885.

Indian and Malayan Oriolis. In Mr. Vigne's list of collection of birds procured by him in Tibet, Kashmir, &c., published in *Proc. Zool. Soc.* for 1841, p. 6, the name *Oriolus galbuloides*, Gould, occurs, as having been obtained in the Alpine Panjab. I have seen no description of this species, but it is not improbably that referred to *O. galbula*, *loc. cit.*; the specimen of which, obtained in the vicinity of Calcutta, having injured its wings and tail while I kept it caged, and its bill also being somewhat diseased, its differences from *O. galbula* (of which the Society as yet possesses only a young female, killed in France,) if any, are not obvious. The Calcutta specimen is a young male, and remarkable for having no tarse whatever of black either before or behind the eye, which is perhaps one of the distinctions of *O. galbuloides*. A very similar bird, in its plumage, occurs in a collection before me from Macao, which I suspect to be a young female of *O. Chinensis*, particularly from the form of the bill; though there is no trace of a black nape: and I would call attention to the approximating resemblance in the form of the bill of *O. Chinensis* to that of the *Plectrorhyncha lanceolata* of Gould, figured in his magnificent birds of Australia, the nest of which, also, as represented by him, and even the note as described, tending to indicate a near affinity on the part of that Australian bird to the Orioles, much closer, I suspect, than in the instance of the well known Regent-bird of the same country (*Sericulus chrysocephalus.*)

P. 799. The supposed variety of *Tephrodornis superciliosus*, having no whitish line over the eye, nor white on the exterior tail-feathers, may be designated *T. grisola*. *Lanius sordidus*, Lesson, in the *Zoologie du Voyage de M. Bélanger*, appears to be referrible to *T. superciliosus*.

P. 801. Add *Dicrurus æratus*, Stephens, to the synonyms of *Prepopterus æneus* in the preceding page. *Dicrurus forficatus*, Gmelin, vel *cristatus*, Vieillot, is stated by Lesson to inhabit Malabar. Which species is intended?

P. 805. Mr. Jerdon informs me that he has recently procured the species of *Turnix* mentioned by Latham as Var. *A.*, inhabiting India and China. Among Dr. Buchanan Hamilton's drawings is that of a species named by him *Turnix tanki*, which is probably the same. Length about six inches and a quarter, of the tarse two inches. Bill and legs yellow: irides white. Nape bright ferruginous: the back ashy, with faint dark cross-markings; wing-coverts light brown, having each a black spot near the tip, which is margined with pale yellowish; the breast a weak ferruginous, paler on the belly; crown light brown, with blackish margins to the feathers, the ear-coverts and over the eye light fulvescent. Evidently a very distinct species.

P. 808. I have considerable misgivings as to whether the *Coturnix flavipes* here intimated may not prove to be imperfectly mature *C. Phillipensis*, since the proportions and the colour of the legs agree, and I have subsequently obtained the latter in this vicinity: but my *impression* still is, that my former specimens were considerably lighter in colour.

Perdix Argoondah is *P. Cambayensis*, Auct.

P. 872. The adult males of *Euplectes Bengalensis* and *Eu. striatus* resemble the females when not in breeding plumage, as stated by Mr. Elliot in the instance of the former. Whether the latter be distinct from *Ploceus flaviceps*, Cuv. (but unpublished ?), of the Paris Museum, remains to be ascertained. The *Fringilla Manyar*, Horsfield, *Lin. Trans.* XIII, 160, subsequently referred by that naturalist to *Ploceus*, is enumerated in his list of Dr. McClelland's birds procured in Assam; and Mr. Jerdon informs me, that the *Ploceus pensilis*, Vieillot, or *Loxia pensilis* of Latham, is mentioned as Bengalese in M. Lesson's *Traité*.

P. 880. *Herpestes*; vide p. 970.

Kemas hylocrius, Ogilby. "The Jungle Sheep" (of Southern India), writes Mr. Jerdon, in confirmation of my remarks on this animal, *loc. cit.*, "is certainly the Muntjac, which is well known to many Madras sportsmen by that name. I suspect, however, that it is a different species from the Javanese. The *Kemas hylocrius* is called *Ibex* by residents in the Neilgherries,—*Rock Sheep*, or rather *Goat*, by the natives. It associates in small herds on the rocky sides of the hills, and does not betake itself to the woods *at all.*"*

P. 882. It appears that the *Tricophorus virescens*, Jerdon, is the same as *Ixos Psidii* (*Muscicapa Psidii*, Gmelin, v. *Turdus analis*, Horsfield), a specimen of which that I forwarded to that naturalist being thus identified by him; but he certainly never sent this species to the Society, but an example of *Tr. flaveolus*, Gould, as I mentioned *loc. cit.*

P. 886 The *Ardea flavicollis*, Wagler, figured by Hardwicke, is merely the young *A. nigra*: but the former name was applied, I believe, by Latham, and would therefore have the priority.†

P. 883. The specimen assigned to *Phyllopneuste rufa* was a young example of my *Ph. lugubris*, as yet undescribed.

P. 970. *Picus strictus*, Horsfield.

The various obligations to which I am under to Mr. Jerdon, late of the 2nd Madras

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* "*Capra (Ibex) Warryato*" is a name introduced into Mr Gray's recent list of alleged new species, but it does not appear from his description of the head only, in what this differs from *Kemas hylocrius* of Ogilby, the animal above noticed.—In a letter which I have just received from Mr. Jerdon, that naturalist also remarks, referring to Gray's paper,—"The *Capra (Ibex) Warryato* is *Kemas hylocrius*, as I dare say you have guessed. The specific name being the *Tamool* name of the animal." I much incline to doubt whether it occurs elsewhere than on the Neilgherries.

† The Society has just received a Chusan specimen of this bird.

Cavalry, and now Civil Surgeon at Nellore, alike for specimens, valuable information, and the identification of species and reduction of their synonyms, will be duly apparent from the foregoing remarks and emendations.

[*Note to p.* 168, *l.* 3 *from bottom, at the word "Calcutta," received after the sheet had gone to Press.*]

The desired information is given, however, at least in part, in *Proc. Zool. Soc.* for 1836, p. 91, on the occasion of Mr. Owen's first distinguishing the *P. morio*, a skull of which was exhibited together with that noticed in the following passage: "Of the two crania of the Bornean Orangs, one differed materially from the other in size and in the development of the cranial ridges, the larger specimen before the Society [the other being *P. morio*] closely resembled the cranium of the Bornean *Pongo* or adult Orang in the Museum of the College of Surgeons, and differed, in precisely the same respects as that specimen, from the cranium of the *Pongo* (supposed to be Sumatran) in the possession of Mr. Cross, described and figured in the first Volume of the [Zoological] Society's Transactions (p. 380, Pl. 53), which induced Mr. Owen to entertain more strongly his original suspicion, that that cranium belonged to an Orang specifically distinct from the great Bornean species (*Simia Wormbii* of Fischer). With respect to the differences alluded to, he stated that the cranium of the great Bornean Orang was characterized by the more oblique plane of the orbits, and consequently the straightness of the contour of the skull between the forehead or *glabella* and the incisor teeth; the external boundaries of the surface were broad and had a rough irregular surface, probably in consequence of the developement of the callous protuberancies which characterize the sides of the face in the adult males of that species. The *symphysis* of the lower jaw was also proportionally deeper than in the (supposed) Sumatran Pongo. * * * The sexual peculiarities observable in the cranium of both the Bornean and Sumatran Pongos are well marked, and are exemplified, first in a difference of relative size, that of the female being about one-sixth smaller; secondly, in a much smaller development of the cranial ridges; and thirdly in the *symphysis menti* being of less depth, the cranium of the female approaching in these respects, according to the usual law of sexual development, towards the characters of the immature animal."

Now it must be borne in mind that neither the Bornean animal with callosities (or *Simia Wormbii*, Fischer), nor Dr. Abel's Sumatran species (upon which was founded *S. Abelii*, Fischer), are really adverted to in the foregoing remarks; these appearing to be precisely the same, as shewn in the text: but two additional forms of this genus, both differing from the animal with callosities (as identified by Mr. Brook), and resembling each other, in the union of the frontal ridges posteriorly along the vertex. With regard to the rugosity of the orbits, noticed by Mr. Owen in the male Bornean skull, the same is observable in the female Bornean skull of that species in this Society's Museum; although it would appear that the animal in question does not possess the callosities: and as compared with the lower jaw of Dr. Abel's Sumatran specimen (of the animal with callosities), that of the female Bornean skull here noticed has the ascending portion of the jaw very much wider (in the *antero-posterior* direction), measuring two inches and three-quarters on a level with the insertion of the molars; while the corresponding breadth in Dr. Abel's male specimen is but two inches and a quarter. the chin also is very differently formed, being deeper and more slanting in the latter, while in the other it is sooner rounded off, and the alveolar portion of the jaw is of more even depth throughout, the termination of the *symphysis* being carried farther backward. In fact, the lower jaw alone exhibits a very striking difference in each of the three species of Orangs before me, sufficient of itself to warrant the *suspicion* of their being distinct.

JOURNAL

OF THE

ASIATIC SOCIETY.

First Report by Dr. Jameson *of his deputation by Government to examine the effects of the great Inundation of the Indus. See Journal As. Society, Vol. X p.* 615.

From the Envoy to the Court of Lahore, to T. H. Maddock, Esq. *Secretary to the Government of India, with the Governor General, dated Camp Kurnaul,* 28*th January,* 1843.

Sir,—I have the honor to transmit a copy of a Report received some time ago from Mr. W. Jameson, Assistant Surgeon, of his expedition to the Indus in 1841, to examine the effects of the flood caused by the disruption of the obstacle that had for several months obstructed the course of the Indus within the mountains.

2. Dr. Jameson failed in his intention of penetrating up the line of the Indus to the supposed locality of the cause of this extraordinary inundation, owing to an attack made upon him and his Sikh escort while he was making a geological survey of the Khuttuk hills, west of Peshawur, where coal beds were believed to exist. When, after many weeks, he was liberated by the assistance of the Sikh Government from the fort of Kohat, the Cabool insurrection and its consequences had rendered it impracticable for the Sikhs to secure for him a safe passage up the line of their western frontier, by which it had been proposed to convey him to, or towards, Gilghit and Khafferistan.

3. I had introduced Mr. Jameson to the Lahore court, where he was cordially received. I had provided him with presents suitable to the wild people he was going to visit. He had received the usual presents and

"*zeafuts*" at the durbar, and was keeping, as instructed by me, a debtor and creditor account of all such transactions. The whole, however, was plundered, leaving a balance on that account against Government of Rs. 2,887 : 7 : 5, which amount I have embodied in my Toshah Khanah account, which is periodically submitted for the sanction of Government.

4. I beg leave to annex an estimate of the value of Mr. Jameson's private property. He lost every thing he possessed, excepting the clothes upon him. Some compensation to a scientific and enterprising young man, who was thus employed by the orders of his Government, would, I think, be money well laid out.

I have, &c.

(Signed) GEORGE CLERK, *Envoy*.

Envoy's Office, Camp Kurnaul,
28th January, 1843.

(Copy.)

TO GEORGE CLERK, ESQ. *Governor General's Agent, North Western Provinces*.

SIR,—In reporting my arrival at the Political Agency, North Western Frontier, I have the honor to lay before you a brief statement of the route I followed in crossing the Punjaub, and from the Indus to Peshawur; at the same time premising, that I shall as soon as possible give a detailed report of my proceedings, which I regret to say must be very imperfect, owing to the loss of all my notes, collections, &c.

2nd. I have already communicated to you what passed at the interviews I had the honor to receive from His Majesty Sheir Singh.

3rd. From Lahore attended by an Agent of the Durbar, Alif Shah, twenty Suwars, a Havildar, and eight Sepoys, I proceeded in a NNW. direction, crossed the Chunab at Ramnuggur, and from thence to Jelalpore on the Salt range. Here I remained for some time to examine the interesting geological phenomena presented, then marched along the foot of the mountains to Pind Dadur Khan, opposite to which, but about three coss distant, are the great Salt mines, named the Koura mines. From the mines all the salt is brought to Pind Dadur Khan, and then sold by Rajah Golaub Singh's officers. After visiting these mines, and examining the neighbouring country, I ascended the hills at Bara, and marched to Maree on the Indus, via Choia, Sidan Khan, Khotas, Durabbi, &c., on a generally barren country, a characteristic mark of these thinly populated mountains. Here and there, only in the neighbourhood of villages, was vegetation met with.

4th. At Maree, I first witnessed some of the devastating effects of the river's inundation that had taken place about six months before, and as you had directed my attention particularly to the examination of this district, under which is comprehended that of Kalabágh, distant about half coss, and on the eastern side of the river, in order to ascertain whether coal was to be met with fit for steam vessel purposes, I remained here a few days, and then prosecuted my researches up the river as far as Sharkar, to determine if the same system of rocks (saliferous system) existed to the northward, and also to witness the extent of the ravages committed by the great *debacle*. After an absence of six days, I returned to Kalabágh, re-examined the various interesting fossiliferous deposits in that neighbourhood, abounding in the remains of fish and saurian animals (?) and coprolites. I mark saurian animals with an interrogation, as the fossils were not of so perfect a nature, as to allow me to say definitely, whether the remains belong to saurian reptiles or sauroid fishes. They are met with in a red sandstone, (the equivalent of the new red sandstone of Europe,) which is superimposed by the red marl, along with which the rock salt, gypsum and alum slate, occur. In some places a limestone is met intervening between the red sandstone and red marl, abounding in fossil organic remains; and at Jellalpore, where in some places the red sandstone is wanting, we have the marl resting immediately upon a limestone without fossils, and presenting all the mineralogical characters of the magnesian limestone of Europe.

I left Kalabágh on the 26th for Cohat, following the route of Elphinstone.

5th. From all the chiefs whose country I passed through, viz. Alla Yar Khán, of Kalabágh, Ghoolam Mustafa Khán, Ghongree of Shakurdurrah, Russool Khán Khuttuk of Elaichi, I received attention, and was by each of them furnished with a guard, having, as requested by the Maharaja, discharged at Maree the twenty Suwars.

6th. I arrived at Cohat on the evening of the 29th November, and was met by Futeh Khán, the Naib and brother-in-law of Sooltán Mohamad Khán, in whose name all orders are issued, and the revenue collected. Next morning he again waited on me, accompanied by several chiefs, (Aga Medi Khán, Oomr Khán, &c.) the Lahore Killadar, and Alaf Shah. Aga Medi Khán apologized for Sirdar Kadar Khân not visiting me, he being unwell. After some general conversation, I was asked the object of my journey, how long I intended to remain, &c. In reply I stated, that I would proceed forthwith; Futeh Khán Aga Medi Khán then remarked, as the former had done the evening previous, that the direct route to Peshawur was not safe, several parties having been lately plundered by the Afreedies. To confirm what they said, they referred to Maharaja Sheir Singh's Killadar, who corroborated their statement, and remarked that now no Sikh party could proceed in safety by this route. Such being the circumstances, and there being no object to be gained in proceeding by this route, I proposed to march viâ Attock. To this they objected, and remarked that it was unnecessary; for, if I would inform General Avitabile, arrangements would be made in a few days to enable me to proceed by the direct route. Alif Shah then asked them (chiefs) why they did not summon the chiefs of the Afreedies? To this they replied, that since the departure of Sultan Mohamad Khán, who had been called to Lahore by orders of the British Government, they had lost all control over the hill tribes. I wrote to Captain Mackeson, and mentioned what I had been told by the authorities of the place, and at the same time intimated that I would either proceed by Attock, or by the direct route to Peshawur, as he should deem fit.

At the interview, the chiefs alluded to the unsettled state of their country; and said that during the night a party of Afreedies had visited my camp, and carried away a report that I had much treasure, (this report was prevalent in the bazar of Cohat, and appears to have reached Peshawur, Captain Mackeson having mentioned it in one of his letters,) and that unless I removed my camp within the walls of their fort, they would not be answerable for its safety. Alif Shah having urged me to adopt this measure, owing to the weakness of my guard, and the authorities refusing to strengthen it with some of their own people, I reluctantly did so, imagining that it would be the means of confirming the hill tribes in their supposition. The true cause of the chiefs being so anxious for me to quarter in their fort I afterwards ascertained, and shall forthwith notice.

In the evening I removed to the fort of Sirdar Kader Khan, the nephew and son-in-law of Sooltan Mohamad Khan. It is rather a fortified village, having a high mud wall, and at the four angles bastions. Nearly all the villages that I saw beyond the Indus were fortified in a similar manner; from the town of Cohat it is distant about a quarter of a mile. The town of Cohat consists of several divisions or villages apart from each other, and in the centre there is a large mud fort garrisoned by three hundred of the Lahore troops. Formerly the guard was relieved every six months, but the present party had been there upwards of a year, and without any prospect of relief or pay.

Next day (1st December) I was visited by Sirdar Kader Khan, who apologised for not visiting me on my first arrival. He was particularly inquisitive regarding the objects of my journey, the cause of my coming to Cohat, &c.

7. When at Kalabágh, and prior to ascending the river, I wrote to Captain Mackeson, mentioning the extraordinary rumours in regard to our troops being in a precarious position not only at Cabul and Jellalabad, but also in many other parts of Affghanistan. Three days after reaching Cohat the answer to this letter reached me, which confirmed the melancholy intelligence received from the natives at Mukud on the Indus, and elsewhere. This was the first authentic information that I had received of the state of affairs to the North West since I left Lahore; none of the letters which you did me the honor to address to me having come to hand.

On the 4th, no answer to the letter addressed to Captain Mackeson having arrived, I told the chief that it would be absolutely necessary for me to march viâ Attock, as the season was rapidly advancing; that I had waited two days longer than the time specified as necessary for the receipt of an answer, and as I had stated to Captain Mackeson that I would proceed by either the Attock or the direct route, I should no doubt find that the chiefs through whose territories I would pass, had been informed by General Avitabile of my intentions. Why the answer had not reached, they could assign no reason, further than the cossid had been seized by the Afreedies, and detained; and they remarked, that if I would remain a day longer, they would send off forthwith another; they further stated, that the route viâ Attock was almost impracticable for camels. This I afterwards ascertained to be incorrect. Early next morning Sirdar Kadar Khan came to my tent, and stated that the carrier which he had dispatched would certainly arrive in the course of the day.

About six o'clock on the evening of the 6th, Duria Khan, one of the Afreedi chiefs in the pay of General Avitabile, arrived in company with Ibrahim Khan, retainer of Shahzada Houssum Khan, a brother of Dost Mahomed, and pensioner of the Sikh Government. They visited me with Alif Shah and delivered a note from Captain Mackeson, intimating that they had been sent by General Avitabile to conduct me by the direct route to Peshawur. With the former there were 50 followers armed with jezails, and at their urgent request I delayed my departure till the 8th. In regard to the directed route, they stated that it was perfectly safe.

8. On the evening of the 7th I received another letter from Captain Mackeson, advising me not to put too much faith in Duria Khan, and that unless the Cohat authorities, as also the Lahore agent, agreed on the practicability of the water, not to proceed by it. On the receipt of this note I sent for Alif Shah, and explained its contents, and also mentioned that Captain Mackeson had sent a Persian letter for Seyed Kasim Khan, requesting him to give me every assistance, which I had transmitted to him through Futteh Khan. He then left me, and returned again in about half an hour, and stated that there would be no annoyance whatever en route, as all the chiefs were to accompany me across the Pass; that the letter sent by Captain Mackeson was not for Seyed Kasim Khan, but for Aga Medi Khan, and that all would be ready to move at day-break next morning. Futteh Khan afterwards waited on me and reiterated the words of Alif Shah.

9. Early next morning (8th) I commenced my march, accompanied by the chiefs (Futteh Khan, Aga Medi Khan, Duria Khan and Ibrahim Khan) with their followers.

The Pass formed by the Teera or Khyber range of mountains, which separates the Peshawur from the Cohat vallies, is about two coss distant from the town, and rises to a height of upwards of a thousand feet; its entrance, between two lateral or subordinate ranges, is protected by a small mud fort garrisoned by Futteh Khan's sepoys. Here I was requested to remain; a sepoy, who had gone on to reconnoitre, having reported that a large body of men, amounting to several hundreds, had assembled at the summit of the Pass, and that it was their intention to dispute our passage; the alarm was given, and the party of the chiefs, amounting to nearly two hundred horse and foot, was joined by as many more. A council was held, and it was decided that the chiefs should first go on, and make an arrangement with the Afreedies. After a delay of about half an hour, a message was sent to me to advance, and also a request that I would give particular orders for no one to straggle in the rear; to prevent this I ordered the laden camels, mules, &c. to go in advance, as the ascent was both very steep and rugged, so much so as to induce Alif Shah and several of the Afghans to dismount and lead their horses. Here and there Afreedies, in parties of two and three, were seen moving about on the adjoining hills, watching our proceedings, but all remained quiet till the baggage had reached the summit of the Pass, on which a matchlock was fired as a signal, and from all sides armed men issued. The hills immediately above us, where not a man was seen the moment before, were now covered, and they opened on us a heavy fire, at which the Dooranis, both horse and foot, fled to shelter; not one of them returning a shot, though they were all well armed. I had to run the gauntlet of a heavy fire, but no sooner was I out of the range of their matchlocks, than all firing ceased. I remained for some time at the mouth of the defile, to see whether any of the Dooranis would join me, but none of them doing so I returned to the fort with my followers, of whom however nine were missing; viz. Alif Shah the Sikh Agent, a Havildar and two Sepoys, Lahore service, a servant of the first mentioned Ali Bukhsh Chupprosee of the Ambala agency, two of my own private servants, and a Sepoy; three of these, desperately wounded, (one of whom died a few days afterwards,) were brought to the fort by Futteh Khan's people; the bodies of the others, (one excepted, said to have been cut to pieces,) were recovered and interred next day. The Sikh agent was among the killed.

10th. About an hour after my arrival at the fort, Sirdar Kadar Khan came to me, condoled in the loss that I had sustained, and abused his people for taking me by that route. One by one the different chiefs joined us, each assigning a reason why I had been attacked, and among the number Aga Medi Khan, who stated that he was severely wounded, as did also others who were with him; his wound however was nothing but a contusion received by a fall from his horse, which was shot under him. It was also stated that many more had been wounded, and many horses carried off. This statement I afterwards found out to be incorrect. In the evening the chiefs were joined by Seyed Kasim (Khán, the first time that I had seen him) who was received with marked respect by Sirdar Kader Khán and others. On asking Futteh Khan, after all the others had left, (who conducted me to a small mud hut for my residence) why his people did not assist me? he replied, that if they had done so, that they (the Dooranis) would have been massacred to a man; that the principal tribes by whom I was attacked were the Bazote, Automkhail and Parkhail, whose chiefs were either in the pay of Captain Mackeson or General Avitabile; viz. Alum Khan, Zemaun Khan and Ishonail Khan, in that of the former; and Rehmit Khan in that of the latter; that Seyed Kasim Khan had aided and abetted them, and that he was a thief and a robber, and at the head of a large banditti who inhabited villages close to Cohat. This is the reason I attribute why the chiefs (Dooranis) were so anxious I should quarter in their fort, fearing lest I should be attacked close to their town.

11th. Next morning I was informed by Duria Khan and Ibrahim Khan, that the cantonments at Caubool had been carried by assault and all the British troops massacred, and this was stated on the authority of a letter said to have been received by General Avitabile, and that the whole country was up in arms. They advised me to leave forthwith, and attempt to cross the Pass during the night. Shortly after they had left me I was visited by Futteh Khan, who asked what I intended to do. I replied that he knew best, and that therefore I would be guided by him and Sirdar Kader Khan, as I was completely in their power. I told him what had been mentioned by Duria Khan; to this he answered that he had double the strength of his garrison, and that as long as I remained in his fort, he would be answerable for my safety.

12th. That same day (9th,) I received a letter for Captain Mackeson, stating, I hear that Duria has gone to bring you to Peshawur by the direct route; he can do it if he likes. The manner however in which both he and his people had conducted themselves the day previous, shewed that I had nothing to expect from him, the reason he assigned for not assisting me being, that he had not received orders to quarrel with these tribes.

13th. That the Dooranis were aware of the attack being intended, I have not a doubt; but probably were obliged by policy to lead me into the snare. They were at the summit of the Pass a quarter of an hour before me, but instead of giving the alarm, they remained quiet till I was completely entangled; the first notice I had, as mentioned, of the hostile intention of the hill tribes, was a savage yell, and discharge of matchlocks. If the statement is true, the accuracy of which I have no reason to doubt, that the tribes mentioned were the principal leaders in the attack, then it was impossible for any body of men to enter the Pass without being noticed by Futteh Khan's garrison. To corroborate it, Futteh Khan stated, that all my property was sold in their villages. It is more than probable that the cause why the credit is given to the Bazote Autimkhail, &c. tribes is owing to their chiefs being patronized by Captain Mackeson; the Douranees on the other hand, being excluded from his durbar. But of this, viz. disunion among the tribes inhabiting the Cohat valley, the population of which is estimated at 5,000, there is no doubt, nor are the Douranees on very friendly terms with their neighbour Rossul Khan, whose resources (4½ lacs,) surpass those of Sooltan Mohamed Khan to the west of the Indus.

14. On the 10th, a cossid arrived from Lahore, with parwanehs from the Maharaja and Minister for Alif Shah, giving him orders to take on the suwars. The man contradicted the statement made to me the day before by the Dooranees, that the Lahore durbar had refused permission to the British troops to pass through the Punjaub, (having passed a large force at Ramnuggar,) which had the effect of altering much of their tone; some of whom were most disrespectful, particularly an individual named Hubbitoula Khan. A few days afterwards Duria Khan left me, having told him that I did not at present require his services; but if afterwards I found that they were necessary, I would send for him. After remaining for some time in Cohat, I offered Futteh Khan Rs. 1,000, for a guard to the Indus viâ Honshialgur, to which he agreed after some demur, and two hours before day-break on the morning of the 28th, I left in company with him and several other chiefs, with a strong body of horse and foot, and crossing the mountainous country belonging to the Afreedies got into the country of Russul Khan, one of whose people joined us. Several of the chiefs returned, as they stated their presence was now unnecessary. Nothing worth noticing happened. In the evening we halted at Pershai, a town belonging to Russul Khan, three coss from the river. His brother, Sirdar Khan, waited on me, and shewed me every attention. Early next morning I marched to the

river in company with Futteh Khan, Oomr Khan, &c. where after presenting them with an order on Peshawur I dismissed them, and then crossed and proceeded to Gumut, from thence marched to Peshawur via Hassun Abdál and Attok, where I arrived on the 6th, having here and there met with much difficulty in procuring bearers for the two wounded men, our story being in general discredited. I left Peshawur again on the 10th, having received four letters ordering my return, and arrived at Feerozepore on the 28th, accompanied by a small guard from General Avitabile. I have the honor to be, Sir,

Your obedient humble servant,
(Signed) W. Jameson,
Assistant Surgeon, on a Deputation to the Sources of the Indus.

Camp Lahore, March 17, 1842.

Dr. Jameson's *Report on the Geology, Zoology, &c. of the Punjaub and part of Affghanistan.*

To G. Clerk, Esq. *Governor General's Agent for the Affairs of the Punjaub.*

Sir,—I have the honor to transmit the first part of my Report, comprehending the Geology of the Salt Range of the Punjaub, and of a part of Affghanistan. I regret that, owing to the loss of all my Notes (a small Note Book excepted) and collections, it is so very imperfect, but still, I trust, it contains some observations worthy of attention.

I have not alluded to the great *debacle* of the Indus, but have deferred its consideration, as also the Zoology of the Punjaub, to the second part of my Report. I have, &c.

Ambala, June 29, 1842. (Signed) W. Jameson, A. S.
On deputation to the Indus.

On the Geology, Zoology, &c. of the Punjaub, and of a part of Affghanistan. *By* William Jameson, Esq. M. A., S. C., M. S. C., &c. *on deputation to the Indus.*

The following observations refer to those parts of the Punjaub and Affghanistan which I have personally visited. Prior to crossing the

Sutledge, I had the good fortune to consult Colonel Garden, Quarter Master General, from whom I received much valuable geographical information regarding the countries to the N. by W. and N. of the Indus. With him I marked out the best line of country to traverse, in order fully to accomplish the main object of my journey; viz. to ascertain *the cause of the great debacle of the Indus*, which had taken place a few months before (June 1841,) and caused vast destruction to life and property. Mr. Clerk, on whose representation I had the honor to be appointed by Government to undertake the investigations, sanctioned the route laid down; and on applying to Maharaja Shere Singh for permission for me to proceed through his dominions, his Highness, on ascertaining the object Government had in view, not only complied with Mr. Clerk's request, but also, with his usual liberality, appointed an agent, and a contingent guard to attend on me, and at the same time transmitted orders to the Governors of the different districts to afford me every assistance and protection. The murder of the agent at Cohat, the unsettled state of the Gilghit country, and other circumstances which shall be afterwards noticed caused my recall, before I had proceeded far on my journey.

PART I.

General Observations on the Punjaub, and on the Geology of the Salt Range, and of a part of Affghanistan.

Punjaub.—The empire included under the name of the Punjaub, is now the most important and extensive governed by any independent native prince in India, not only from the great resources at its command, but also from its position; as it commands the whole of the North-western frontier of British India, a direction from whence alone the British empire can be invaded by any power in sufficient force to threaten its stability.

Geographical Position.—The Punjaub properly speaking, comprehends those tracts of country lying between the five great rivers which run from North to South, the most westerly one being the Indus, the easterly the Sutledge. But the restless and ambitious spirit of the late celebrated Maharaja Runjeet Singh, encouraged by chiefs equally ambitious with himself, caused him to carry his arms beyond the Indus into rocky mountainous countries, which though he overran, are anything but subdued, and are ready to a man, to rise at the first signal reverse happening to the Sikh arms. It is bounded to the East and South East by the Sutledge; to the North by the snowy range of the Himalaya, beyond which its feudatories, the Jummoo Rajas, had carried their arms; to the West by the Khybur and Soliman ranges of mountains; and to the South by the state of Sinde and Bahawulpore. The whole country is of an ovoidal form, lying in a S. W. and N. E. direction, with the apex towards Shikarpore, between the latitudes of 29° and 34° N., and longitudes of 71° and 76° E. and covering about 85,000 square miles. But although this country covers a vast deal of ground, a great part of it only nominally belongs to the Sikhs. This is the case with all the hilly country N. W. of Lahore, Sucket, Mundee, &c. a large portion of the hilly country west of the Indus, with the exception of Peshawur, Dera Ismaeel Khan and Dera Ghazee Khan, which are ruled by Sikh governors; viz. the country to the North and West of Durbund, all the country south of the Teeree or Khybur range, comprehending Cohat, Khuttuk, Kalabágh, &c.

Physical aspect of the Country.—The Punjaub is an extensive flat plain with mountains to the North and West, and open to the South and East, and traversed by five magnificent rivers, the Sutledge, Ravee, Chinaub, Jehlum, and Indus, the fertilizing effects of which, protected and encouraged by a mild and powerful Government, will some day render it one of the finest countries in India. At the present moment, the vast plain presents nothing but a waste, comparatively speaking, with here and there cultivation. Even in the neighbourhood of the very capital itself we meet with extensive jungles, the luxuriance of their rank vegetation shewing what the country could be made. But of all people in India, there are probably none so badly adapted for the plough as the Sikhs; and the other inhabitants of the Punjaub form, comparatively speaking, but a small population for this extensive country. There is nothing, however, which strikes the traveller so much as the scanty population* of the Punjaub, when compared with the well populated country include dunder the protected states. Proceeding from Lahore to Julalpore, viâ Kori, Meraliwallah, Allipore, Ramnuggur, Mangut, &c.

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* The greater part of the Mussulman agricultural population of the Punjaub are Juts, a class of Hindkees.

we pass over vast uncultivated tracts, with here and there in the centre of the bushy jungle a small village, with some rich cultivated fields around; now and then breaking up the monotony of the flat plain, we meet with the hillocks marking the sites of towns and villages which are now no more; but of which the streets and houses have left this memento of their former existence; or deep ravines, the haunts of the wolf and the jackal. Bands of sand traverse the country in a N. and S. direction, which point out the old beds of rivers, and prove that all of them have been changed. Thus the Sutledge, which formerly ran close to the town of Loodianah, is now seven miles to the northward; the Ravee which twenty years ago washed the walls of the city of Lahore, runs in a channel three miles off to the northward; the Chunab which ten or twelve years ago ran close to the town of Ramnuggur, is now four miles distant; and the same applies to the Jehlum. These changes also are striking in the Indus, where it leaves its mountain channel at Kalabágh. Kunkur, a compact marl, formed no doubt from the deposition of springs that formerly existed, is frequently to be found, forming beds, &c. in the clayey soil. But till we reach Jalalpore, we do not meet with any other rock in situ.

Soils.—The soil varies in a remarkable degree from stiff clay to sand, mixed with each other in variable proportions and with vegetable matter. Between Jalalpore and Pind Dadur Khan, it consists of a black rich loam, and is probably the finest we saw in the Punjaub. Mixed up with the soils, carbonate and sulphate of soda are frequently met with, and if in quantity the land is not worth cultivating. Several large tracts are in this manner rendered barren, particularly on the West side of the Indus in proceeding to Peshawur.

Salt Range.—From Jalalpore, the salt range extends in a N. W. by W. direction on to Maree on the Indus, when it crosses the river, and can be traced from thence onwards to the Khybur or Teera mountains. From it various secondary branches proceed, as one to the N., where it is met with in the neighbourhood of Rotas, and on which the fort of that name is built, forming the Tillah hills of Elphinstone; it extends for a short distance Northward, and probably then makes a bend to the Eastward. All these ranges join the low group of hills to the North-east, but none of them cross the Jelum below the town of Jelum. These, however, cross there and run on by Bimber, Jummoo, Nurpoor, and down by the South of Belaspore, crossing the Jumna, at Fyzabad, and the Ganges at Hurdwar.* The whole course from Jelum is as near South-east as possible, like all the other secondary ranges of the Himalayas.† The salt range is parallel to the central or high mountain range.

Rocks.—The rocks met with at Jelalpore, consist of

1. Limestone,
2. Sandstone,
3. Sandstone Conglomerate,
4. Red and green Marls,
5. Gypsum,
6. Conglomerate.

Conglomerate.—Resting upon the five rocks mentioned, in an unconformable position, there is a conglomerate, held together partly by calcareous and partly by siliceous matter; in it occur rounded masses or boulders of granite, syenite, trap, quartz rock and limestone, &c., the last of which abounds with organic remains. We meet with this rock in situ some miles to the Westward, and on the road leading to Kalabágh, as well as at that place, it points out the direction followed by the stream which deposited the conglomerate.

Limestone.—It is very compact, and varies in colour from greyish white to greyish black; it is devoid of organic remains, and forms the highest parts of the mountains, rising to a height of about 1500 feet above the river Jehlum.

Sandstone Conglomerate.—The town of Jelalpore is built on the inclined sandstone conglomerate strata, and principally of that rock. It has a very pretty appearance, the houses being neatly arranged in a niche of the mountains, and about sixty feet up the acclivity, the name dates back to the time of Jehangeer, at which period it was large and populous; the ruins, now seen about two hundred feet above the present site, testify to the accuracy of the statement. It was destroyed by Runjeet Singh about the commencement of his career, it being then principally inhabited by Mussulmans. Hindoos now form the bulk of the population. On the hill overlooking it, are the ruins of an old fort, which appears to have been almost entirely built of boulders.

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* Journal of the Asiatic Society. † Elphinstone's Caubul, vol. II. p. 407.

All the rocks, with the exception of the conglomerate mentioned, are highly inclined, the angle varying from 35° to 60°; there is no uniform direction, as they dip N. E. and W.; nor is there any plutonian rock seen to account for this extraordinary arrangement.

Gypsum—Economical Uses.—The gypsum occurs imbedded in the red and green marls, its color being either white, rose or brick red; from this place to the river, which is only distant half coss, masses of any size might be carried, and it is found here equal to the finest gypseous alabaster of the European continent; it is of this substance that the beautiful groups of small white figures and vases imported from Italy are made. The celebrated plaster of Paris is procured by exposing this rock to heat, which deprives it of its water of crystallization, it then falls to the state of a white powder, which has a strong affinity for water. Captain Franklin speaking about this rock, as found among the Himalayas, says, "It is probable that its chief use in Bengal for some time, would be as convertible into plaster of Paris, and affording a material for cornices and ornamental work, to the banishment of the very rude productions of this kind that we have hitherto put up with." There is *perhaps a sufficient quantity of it* to answer any demand likely immediately to arise. When the Government House was last repaired, it was considered desirable to obtain a sufficiency for the purpose above-mentioned; but the fact of its occurrence within our own mountain provinces was not known at that time; *as it is within fifty or sixty miles of water carriage, it might be expected to pay for its transport.* In addition to its value in the arts, it forms an excellent manure, and could be applied with great advantage to many of the soils in the Punjab. To the native its uses are quite unknown; but when it is appreciated, or rather when the country falls into the hands of a Government which knows its value, we may venture to predict, from its occurring in such vast quantity close to the banks of the river, that it will form a valuable article of exportation to Bombay, &c. or even now, as by the excellent arrangements made with the Lahore Government by Mr. Clerk, it is not liable to duty. To the Bombay Government therefore the gypsum is well worthy of attention, seeing that it might be most advantageously used in the public buildings, in making the ornamental works, and for many other purposes; and it would, as Captain Franklin remarks, afford the proper material for making cornices to the exclusion of the rude articles now in use. The experiment is well worthy of a trial, whether executed by Government or by private means; if by the latter, and encouraged, it would no doubt yield a good return.

Proceeding along the hills in a W. by N. direction, we reached the village of Aaganwallah, distant about four coss. The inhabitants are principally Awans;* we ought rather to say *were*, seeing that it is almost entirely deserted, owing to the rapacity of Raja Goolab Singh's soldiery. To reach the village we proceeded up the banks of a small ravine, and as we approached its vicinity, we found the road all paved with rounded boulders, which are strewed over the whole country. On the hill above them is a fort garrisoned by 200 of the Jummoo troops.

Gypsum in enormous beds of 13 feet in thickness and upwards is here met with; and associated with it, the pure crystalline variety, named selenite.

Jutaneh Salt Mines.—A few miles further to the W. and by N. is the village of Kewal, where we pitched our camp, and proceeded to examine the salt mine of Jutaneh, distant about 4 coss. The road lies along the base of the mountains, and abounds with ravines. On the acclivity is seen the pretty village of that name, surrounded by palm trees; it is the residence of the miners, and contains about two hundred inhabitants. The mines, however, are about two miles further on, but beyond this all the water is either salt or brackish, and to reach them, we proceeded up the bed of a small nullah, by the action of the stream of which the strata have been well exposed. The mines, three in number, are about 45 feet above the bed of the stream, and have been opened 20, 30 and 35 years respectively; the shafts are about six feet in height and three in breadth, varying in length from 140 to 180 yards, and sunk through the red marl, in which rock the rock salt occurs imbedded. It also contains large imbedded masses of gypsum, which in many places are highly polished by the mere friction of the miners' bodies in passing and repassing. The descent is down a gradually inclined plane till we reach the principal bed, when we descend into the body of the mine by steps cut in the salt. Before arriving at the principal bed of salt, however, we pass several smaller ones, varying from three to six feet in thickness; the largest, the one now worked, is from 170 to 200 feet.

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* The Awans, according to Elphinstone, belong to the class of Hindkees; they form nearly the whole population of the country on the East side of the Indus to the South of Attock. Some part of the country is occupied by the Khuttuks and Bauricks.

Mines.—The dress of the miner consists of a small piece of dirty white cotton cloth wrapped round the middle of the body, a similar piece round the head; and to protect his shins from the splinters of rock salt, a thick pad of black woollen cloth is worn. His tools are few in number and of a simple nature; viz. a large hammer, sharp-pointed at one end and flattened at the other, chisels and handspike; with these, he removes masses varying in weight from three to four pucka maunds (240 to 320 lbs.), two of which are a camel load. Smaller masses are also removed to load oxen, &c. In removing the large masses accidents, owing to the narrowness of the shafts, frequently occur. To light up the mine, small oil lamps are used, appended to which are long hooks, in order to fasten them to any projecting piece of rock salt. The miner is capable of removing from situ eight pucka maunds per diem, for which he receives an anna per maund, but he supplies himself with tools and oil, which cost four annas. On carrying the salt out of the mine, an additional two annas is given; this however is the work of another individual, who is capable of removing sixteen maunds per diem. By camels, bullocks, &c. the salt is conveyed to Pind Dadur Khan, (as no salt is allowed to be sold at the mines,) and there sold at the rate of a rupee the pucka maund. When the Maharajah Runjeet Singh held the mines in his own hands, a rupee was charged for a camel load; but prior to farming them out to the Jammoo Rajas, he had raised the price to 2 rupees. Now the price of a camel load varies from 6 to 8 rupees, and before reaching Ambala, paying hire, duty, &c., it costs from 8 to 20 rupees.

The salt is sold in the bazar at the rate of from 13 to 15 seers per rupee.

The mines are guarded by a party of the Raja's hill troops. In the central division of the town of Pind Dadur Khan, (it being divided into three,) which contains about 10,000 inhabitants, there is a mud fort also garrisoned by a battalion of their troops, with some horse artillery; facing it, there is a wide plain on which the salt was lying in great quantity; here also scales are erected for weighing it prior to loading the camels, of which there were about 70 or 80 present.

Koura Mine.—Further to the westward is the largest mine; viz. that of Koura, so named from a village of that name; it is four coss from Pind Dadur Khan, and the route to it is similar to that which leads to the other mines, up the bed of a mountain torrent, containing but little water, its banks however were in many places covered with efflorescence of salt, resembling much from its pure white color, snow that had newly fallen. The village of Koura built on the acclivity of a small hill is close to the mine, and contains about 250 inhabitants. Here we were met by some of Raja Goolaub Singh's people. The shaft is similar to those already described, but of a greater length, being not less than 300 yards. On sinking it, much practical knowledge has been evinced; thus, in the gallery we frequently pass beds of ten and twelve feet in thickness, these, however, have been cut through, and left untouched, and the shaft carried on to the great deposit; but how the individual who first opened the mine was led to conclude that a large bed of salt existed beyond the smaller ones, (it being so contrary to the native character to risk capital if a means of repaying him with interest, for that he has already laid out, is presented, which undoubtedly the beds mentioned would have done;) whether by the out-cropping of the salt in another part of the hills, from mining operations carried on in some other place, or from geological reasoning, we could not ascertain. Even as to the definite time when the mines were opened, we could not get any information, further than that it was during the time of the emperors. On entering the mine all the natives took off their shoes, and proceeded barefooted. After we had gone down the gently inclined plane some two hundred yards, the air became very oppressive; to descend into the great cavities we found a similar arrangement of steps cut in the solid rock salt, but the sight presented here was truly magnificent, far surpassing any geological exhibition that we had ever witnessed, and well repaid us for our suffocating trip. By the innumerable lamps the mine was well lighted up, which being reflected by the beautiful crystalline walls, formed a splendid and brilliant hall of about three hundred feet in circumference by fifty in height, contrasting well with a deep dark abyss, to the end of which the eye could not penetrate, formed by an old abandoned shaft which water had inundated. Adjoining to this, there are several others in a similar state. The thickness of the principal bed could not be ascertained, as it occupies the whole extent of the mine, but it is upwards of several hundred feet.

Characters of the Rock Salt.—The rock salt in colour varies from white to flesh or brick red, granular, the concretions being very large and very compact, so much so, that various ornamental articles are cut out of it. I was presented with a series of small vessels of it, which were highly polished; in pieces of about an inch in thickness it is transparent or semi-transparent; it occasionally assumes the stalactitic form, several stalactites of a pure white colour, and more than a foot long were brought to me. This salt is extensively used throughout India, and is so pure as only to require grinding.

At 8 A. M. the thermometer stood in the shade at 45°, in the mine at 82°; but owing to the particular state of the air, it appeared to be much more; to health it is most prejudicial; the natives informed me that all of them suffer severely, after working a few years, from affections of the chest, so much so, that the average period of life with them does not average more than from thirty-five to forty years; all presented a most sickly appearance, similar to that which we observed in individuals living near to marshy districts in the Pinjore valley.

Relations of the Strata.—The relative position which the strata bear to each other, is well seen in the section formed by the bed of the nullah. Here we have a red compact sandstone forming the fundamental rocks, and inclining at an angle of from 35° to 55°; resting upon it we find the red marl in which the rock salt occurs imbedded. Gypsum does not occur in beds, but imbedded masses in the marl. In color the marl is red, green, greyish white, &c. Forming the superincumbent rock there is a breccia, consisting of red sandstone, marl, gypsum, and limestone, held together by calcareous matter, and resting in an unconformable position, as the rock at Jelalpore, and like it the limestone boulders contain organic remains, and in such quantity do they occur as to lead to the supposition, that it has been almost entirely, though not exclusively, formed through the agency of the fossil animals. Since the brilliant discoveries of Ehrenberg with the microscope, which have brought to light a new world of animals, the old dogma, omnis calx e vermibus; omnis silex e vermibus; omnis ferrum e vermibus, has been again revived; the size of these animals is sometimes so very minute, that Ehrenberg has proved that a million may occur in a cubic inch of chalk. But it has been proved that the organic matter does not always bear the same proportion in chalk from different quarters; thus in specimens from the North of Europe, the quantity of inorganic earthy chalk exceeds that of the organic bodies; but in specimens from the South of Europe, the animal remains largely predominate. Ehrenberg in his work on the animalcular constitution of chalk, describes and figures specimens from twelve localities in Europe, Asia, and Africa, all of which are filled with foraminiferous and other minute chambered shells; the number of species amounting to 81, some calcareous and some siliceous, including twenty-two species of microscopic nautilites, nummulites, and cyprides, and forty species of infusori; with these there are a few confervæ and other minute vegetables.* That the calcareous matter which invests the exuviæ of molluscous and radiated animals found in the limestone above-mentioned, as also in a nummulitic limestone which we shall afterwards notice as occurring among the Himalayas, the limestone of Caraberg, the muschelkalk of the continent of Europe, the nummulitic limestone of Hussun Abdal, the encrinal and coral limestone of the silurian and carboniferous systems, is a segregation, (as supposed by Buckland and Jameson,) from the waters in which these were deposited, and not formed by the animals themselves, is more than probable.

As we ascend the Pass leading into the salt range which lies four coss to the N. W. from Pind Dadur Khan we cross over a range of limestone abounding with organic remains, similar to those met on the boulders; in height it is about 500 feet, very rugged and steep, and two miles in length. At the summit is the village of Chout, we then get into a large and well cultivated valley, through which our route lay six miles, and cross a small hill of fossiliferous limestone, in which a thick bed of brown iron ore or hematite occurs imbedded, and from Ehrenberg's researches we are entitled to infer, that in it organic remains will be found. Descending a gentle acclivity, we arrive at the small but pretty village of Choia Sydun Shah; from whence the road to Rotas winds along the banks of a small stream, whose water is supplied by a large spring in the centre of the town. Its inhabitants are mostly all fukeers, and it is so celebrated for its sanctity by the Hindoos, as to cause them to bring the bodies of their relations here, for fifty miles round, in order to burn them. When we were there, there were several burning, and the ashes of others collected in heaps. Of Maharaja Runjeet Singh, who has built a large house, it was a favorite resort, and there was one building for the Jummoo Rajas, (Dhian Singh and Goolaub Singh.) The building material is limestone, the rock of the district. On it in the neighbourhood of Rotas there is a coating of calcareous sinter and tuffa,* fifteen feet or more in thickness, shewing that springs (they bring spring deposits,) were formerly more abundant than they now are. They, as well as the limestone, are extensively used for building purposes, and for making lime.

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* Buckland; Edinb. New Phil. Journ. vol. XXI. p. 441.

Springs.—The springs, like all the other springs in the Punjaub and Affghanistan,† which issue from limestone districts, belong to that division which is hot in winter and cold in summer; the temperature of the air in the morning being twenty degrees lower than that of the water. Similar springs were met with among the Himalayas, in the Bijouni valley, between Saeeki Huttee and Belaspore, Cohat, Hussun Abdul, &c. The depth of the one at Rotas is said to be unknown. Regarding it there is a tradition which I was told by one of the natives, viz. that a man who had been engaged making a rope for twelve years attempted with it to fathom it, but could not find any bottom. Opposite the spring a *shamianah* is erected, and beneath it a *charpoi*, covered with a white sheet; here a *Grunth*, (the sacred book of the Sikhs,) is placed, and before it sits a man night and day with a punka in his hand, to drive away flies, repeating passages from the sacred volume.

From Rotas on to Maree on the Indus the whole country consists of extensive plains surrounded by mountains, in general barren in the extreme. It is in these that the best horses of the Punjaub are bred, but that does not infer much, as a very good country bred horse is seldom seen.

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* Probably this is the rock alluded to by my friend Mr. Griffith in his report on the subjects connected with Affghanistan, when mentioning the sources of springs he says, "The bed of the ravine by which the army descended from Lala Ghurree Beg, was found to be dry to within one mile of Ali Musjid, at a place called Siri Chushma, where there are copious supplies *from a soil of cavernous limestone.* Indeed, this rock seems to be the principal source of the springs of the country in those parts beyond the influence of the melting of the perpetual snows." Journal Asiatic Society, new series, No. 34, page 809.

† See Reports by Lord, Burnes, Griffith, &c.

The higher and mountainous parts of the country are composed of limestone and red marl, and the plains, when an outcrop is seen, of sandstone and conglomerate, the former being sometimes of a green color, and but little inclined. At Kullur Kahar, the conglomerate is unconformable to the other rocks, and in its character differs from that rock at Jelalpore, in the limestone containing no organic remains. Proceeding onwards W. N. W., we cross many mountain streams or nullas, all of them in general receiving the name of Soane, owing to the sand on their banks containing gold, for which it is extensively washed during every month of the year; that of December, January, and February excepted. The gold obtained is similar to that found on the banks of the Indus. From Muzan to Maree the country is still open, till within three coss of the latter, when the mountains contract, forming a narrow defile, the saliferous rocks on either side rising to a height of two and three hundred feet. As we approach near the banks of the river, the country is covered with boulders of trap, granite, syenite, hornstone, porphyry, &c.

Maree and Kalabágh.—Of all geological sites in India, there are probably none more interesting or important than that comprehended under Maree and Kalabágh, the former on the East, the latter on the West side of the river Indus, and distant from each other about half coss; interesting for the nature, position, and organic remains which the rocks contain; and important from its mineralogical riches.

Rocks.—1. Magnesian Limestone.
2. New red Sandstone.
3. Fossiliferous Limestone.
4. Red Marl and Sandstone, with
  i. Coal and Mineral Sulphur.
  ii. Rock Salt.
  iii. Gypsum.
  iv. Brown and red Iron Ore.
  v. Alum Slate.

The oldest rock met with is the magnesian limestone, which varies in color from pale grey to dark blue; fracture more or less conchoidal, with an earthy aspect; hornstone occurs in it in layers or imbedded masses. The lower beds are destitute of organic remains, but the upper abound in them; the most common fossils being marine shells belonging to the genera producti, spirifer, gryphaea, nautilus, &c.

Imbedded in it there are also enormous masses of red and brown iron ore or hematite, which resisting the action of the weather better than the limestone, stand out in bold relief. In many places the needle of the compass is rendered quite useless, even at a considerable distance from the rocks, owing to their being highly magnetic from the quantity of iron which they contain. Resting upon the limestone, we have sandstone, varying in colour from greyish white to dark reddish brown; in some places so soft as to crumble under the finger; in others so hard as to give sparks with steel. The compact dark variety whose colour is owing to the peroxide of iron, abounds with teeth, bones, and coprolites of enormous animals, judging from the size of the first; but whether they belong to saurians or sauroid fishes, we have not been able to determine from the imperfect nature of the specimens, but probably to the latter. In Cutch, a caudal vertebra, said by Messrs. Clift and Owen to belong to a saurian has been found in strata, which appear to belong to the lias or oolite period.* We broke up enormous slabs of red sandstone studded with teeth, some of whose summits were quite flat, being worn down, shewing that the animal to which they belonged had far advanced in years. In the coprolites, teeth and scales occur, pointing out that their habits were carnivorous. In England, in this formation, the remains of two saurian genera palæosaurus and thecodontosaurus have been found,† and they are the most ancient examples of fossil reptiles yet found in the British islands. In their organization, they are allied to the iguana and monitor. In Germany, saurians have been met with in the zechstein limestone, which is the oldest rock on the continent in which these remains have been found; they belong to the genera protorosaurus, also allied to the monitors. It is, however, remarkable that the sandstone in which the organic remains occur at Kalabágh is deeply coloured with the peroxide of iron, and it is a well known fact, that scarcely any are ever found in rocks where this metal is found to abound; thus we often find red and white sandstones alternating with each other, but only the latter containing organic remains; and in England and Scotland it is the grey and calcareous beds. Some exceptions to this rule are met with as in Forfarshire, and Lord Greenock we think, found fossil teeth and coprolites in a red sandstone in East Lothian.

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* Grant's Trans. Geological Society, II. Sec. Vol. V.

† See Proc. Geological Society, No. 45, Messrs. Riley and Stuchbury, as quoted by Lyell.

Resting upon the red sandstone we have the red marl in which the rock salt and gypsum occur imbedded. Its colour, as in other quarters mentioned, varies exceedingly, being red, white, blue, green, &c. The rock salt occurs in vast beds of several hundred feet in thickness, exposed and close to the edge of the river, so that when it rises, owing to the hot season causing the melting of the snow in the mountainous regions to the N. and N. N. W., it uniformly washes away a part of the salt; its color is generally red, approaching to rose red, but sometimes white; structure lamellated, but very compact. The gypsum associated with it is either of a rose red, or greyish white colour, and of a granular structure. Like the rock salt, it occurs forming mountains of considerable height; in some places we find it studded with crystals of rock crystal, the colour varying in general with the rock; the most beautiful varieties are the rose red, but they also occur white, grey, brick red, black, &c., varying from transparent on the edges to semitransparent, translucent and opaque; in form generally the six-sided prism terminated by the double six-sided pyramid, but with numerous modifications of the terminal planes, and sometimes the lateral planes are wanting altogether, when we have formed the double six-sided pyramid. In other crystals one of the lateral planes will be large at the expense of all the other five, which are only represented in miniature, but the forms are much too varied to attempt to notice them all. In size they vary from that of millet seed to two or three inches. The resplendent appearance presented by the gypsum when the sun is shining, produced by these imbedded crystals, is very striking. The occurrence of rock crystal in this locality is both very extraordinary and exceedingly interesting, and this is the only one that we are aware of in which silica in a pure state is thus associated with sulphate of lime. In the carbonate of lime or limestone, it is met with, but even in this locality it is rare. The crystals are of contemporaneous formation with the gypsum, and probably have been formed by segregation of silica from that rock. In the rock salt, though much more rarely, crystals are also found imbedded.

Associated with the red marl there is a *white sandstone* in which coal along with *mineral* sulphur occurs. To examine its value and adaptation to economical purposes, particularly steam vessels, was one of the principal objects of my journey to this place. The late lamented travellers, Burnes and Wood, had each reported, I believe, to Government, and pointed out that this district would yield coal in sufficient quantity to supply the demand; if, however, any attention had been paid to the geological structure of the country by them, they could have at once declared that no coal of value or worth working would be found.

Some months prior to undertaking the journey, a series of papers regarding the coal of Kalabágh was put into my hands by Mr. G. Clerk, Governor General's Agent, requesting me to give my opinion as to the probability of coal being found in the district of Kalabágh in any quantity. After perusing the papers, I answered in the negative, unless it was found that the true coal formation, or carboniferous system, dipped under the saliferous system, out-croppings of which might be found containing beds of coal. Such, however, is not the case. But one of the enterprising officers mentioned, has even gone further, and asserted, that "were the salt range, East of the Indus examined by a geologist, there is ample reason to believe, that discoveries of value to Government would be the result," alluding to the discovery of coal. In a private letter to the address of Mr. G. Clerk, an extract of which has been published in the Asiatic Society's Journal, we mentioned the existence of coal, probably the same as found by Burnes* and Wood; *it is not* true bituminous coal, and had they examined the localities *in which it* was found, and the district, they would, had they been at all conversant with geology, have come to the conclusion, that the Kalabágh district would not yield coal in sufficient quantity fit to be used for economical purposes. In no place has *bituminous* coal ever been met with worth working above the magnesian limestone. Statements have been made to this effect, but when properly examined, have invariably been found to be incorrect. In the letter above quoted, dated 15th November, 1841, we state, that the coal met with at Kalabágh occurs in thin seams in a white sandstone that alternates with the red marls in which the rock salt and gypsum are imbedded. The largest seam is, in breadth about seventeen inches, consisting partly of coal, sandstone, and mineral sulphur. The coal met with is partly brown coal and lignite, and partly jet and not true bituminous coal; but well adapted, from the experiments which we made on a small scale, for steam purposes, burning with much flame, emitting much gas, and at the same time leaving but a small quantity of earthy matter or ashes.* Probably, however, they were led into error, which even in Britain sometimes happens, by confounding the alum slate, which is of a greyish black colour, and is associated with the white sandstone in which the seams of coal occur. This is not at all improbable, as the colour of the alum slate is so very dark, and so apt to deceive the eye of the traveller; the colour too, is owing to bituminous matter. The use of coal as a fuel is unknown to the natives, being used by them as a medicine in various diseases, and is so much prized as to have led them to suppose, that a large sum would be given for it. From the different seams, about two thousand maunds had been collected and brought to the town of Kalabágh, where it was stored up by a number of individuals, in quantities of from 10 to 100 maunds, for which they expected to get 4 rupees per pucka maund=℔ 64.

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* Specimens of supposed coal were transmitted to the late Secretary of the Asiatic Society in 1832, from Luchee, Kurpa, &c. On examination he found, that they were nothing but bituminous slate. How such an error could have been committed in forwarding such specimens, is very extraordinary.

Resting upon the red sandstone, we meet with a limestone abounding with fossil organic remains; it occupies the same position as the muschelkalk, a formation which has only been properly identified in France and Germany. Murchison has no doubt pointed out certain beds in England as its equivalent, as in them he has found many organic remains, which are also found in the muschelkalk or shell limestone. Such characters deserve the highest consideration; but on the other hand, if in another quarter of the world a limestone is found with organic remains, differing from those met with in a rock holding the same geological position in Europe, are we from this character to infer that these rocks are of different ages? If we do this, we are taking for granted, that at the time of the deposition of the saliferous system, the laws which regulate the distribution of the organic kingdom, operated simultaneously throughout the globe. If we look at the organic world of the present day, and trace out its distribution, we find that in each continent, we have a particular series of animals and plants peculiar to it. Thus for instance, let us first examine the mammalogical kingdom. To how many genera does this remark not apply?

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* Journal of the Asiatic Society, 2d Series, No. 37, p. 2.

Thus in America, we have the genera Cebus, Iacchus, Procyon, Cercoleptes, Didelphis, Condylura, Icalops, Auchenia, Myrmicophaga, Cavia, &c. In Australasia: Echidna, Thylacynus, Dasyurus, Perameles, Ornithorynchus, Phascolarctos, Petaurus, Phascolomys, &c. In Asia, Galeopethicus, Dysopes, Ailurus, Artictes, Paradoxurus, Moschus, &c. Peculiar to Africa and Europe, we could also point out many genera. Again, if we turn our attention to the ornithological kingdom, we shall find the same remarks to apply. Thus proper to America, we find the Genera Pipra,* Rupicola, Phibalura, Casmorhynchus, Gymnocephalus, Procnias, Alector, Crax, Penelope, Dicholophus, Crotophaga, Cassicus, Icterus, Zanthornus, Rhamphastos, Rheas, Tanagra. In Asia, Calyptomena, Satyra, Tetraogallus, Lophophorus, Argus, Polyplectron.

These, however, are only cited for argument, seeing that we could point out genera in every department of animated nature as peculiar to individual continents. Moreover, in the distribution of animals and plants throughout each continent, we find most striking differences depending upon the position. Thus the Zoology of Northern Asia is strikingly different from that of the Southern; the Zoology of Southern Africa, from that of Western Africa; and as we have elsewhere remarked, " as in the Botanical, so in the Zoological kingdom, we shall no doubt find a series of Birds, Quadrupeds, &c. having as their fixed places of abode certain regions of the world, beyond which, though a few may migrate, yet upon a careful examination, the greater number will be found to be confined."†

Such being the state of the distribution of the organic kingdom as now exhibited, are we entitled to infer that it, long prior to the creation of man, was subjected to laws differing from those now in action? Our knowledge regarding fossil organic remains would lead us to infer that such was not the case, though probably during the deposition of the carboniferous, saliferous, and oolitic, wealden, and in the cretaceous and older tertiary systems, the climate in northern regions was then milder than it now is, and that genera of animals and plants were there met with which are now peculiar to tropical regions. Allowing this to be the fact,

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[*] By Dr. Burton a species of pipra is said to have been found among the Himalayas. Is it not a Parus? See Proc. Zool. Soc.

[†] Journal of the Asiatic Society, No. 85, page 26.

which we must do, as the observations are based upon incontrovertible data, we are not to admit that if we find strata connected with a particular system, and occupying the same position as they do in Europe and elsewhere, and composed of the same rocks, that they, because their organic remains differ, are not of contemporaneous formation. Thus for instance in the limestone rock, which we consider as the equivalent of the muschelkalk, we meet with a coral nearly allied to the Eunomia radiata, a fossil met with in the oolite. Agassiz, an authority of the highest order, has asserted, that no species occur in two geological formations, or even in two different parts of one formation; and he says, that he has come to this conclusion, not only from an examination of the species of Trigonia, but that it has been confirmed by his examination of fossil fishes and echinodermata.* His statement, based upon ample researches, and a profound knowledge of the subjects investigated, will go far to check that rage which now exists among geologists, of identifying species found in different parts of a formation with each other; but we agree with Brown, that there are species which pass from one subdivision of a formation to the other, and even from one formation into another. Agassiz, to throw aside all observations which have been made by his predecessors, asserts, *that no so-termed character—that is, no observable mark—can be so striking as to indicate an absolute specific distinction; but at the same time it should never be regarded so trifling as to point to absolute identity; that characters do not mark off species, but that the combined relations to the external world in all circumstances do.*† How are varieties to be distinguished? Is the influence of the relations of the external world uniform? Undoubtedly not, and as Brown says, many of the distinctions adhering to individuals are the mere result of such an influence, or in other words, Agassiz wishes to prove, that until the geognostical and geological relations are examined, the species cannot be determined, following an extreme course in opposition to those fossil geologists who maintain, that by an examination of a few fossils, they can tell the age of any deposits.

Many of the fossils met with in the limestone which we consider as the equivalent of the muschelkalk, are nearly allied to those met with in the same formation elsewhere, but the greater number of them are distinct.

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* Edinb. New Phil. Journ. No. 63, page 97.

† Edinb. New Phil. Journal, No. 63, p. 97.

Talking of the relative ages of the salt formation, McCulloch has fallen into a most extraordinary error. Thus, he says, "This stratum (saliferous formation) abounds all over Asia; and he who desires to trace its extent, may apparently do it with safety, by examining the sandy deserts on a map; since wherever they have been described by travellers, it is invariably found that salt occurs in them. There seems no reason to doubt that all sandy deserts of the world belong to this stratum, and hence the salt pools and the brackish water that makes so conspicuous a figure in the narratives of travellers; I may name out of the many, the salt range of hills crossing the Indus at Kalabágh, and extending to Jelalpore; the desert of salt between Tehran and Ispahan; that which extends from the Helmund river in Seistan to the range which divides that province from lower Mekran, of four hundred miles in length; and another of equal dimensions, which reaches from Koom and Kashan, to the provinces of Mazanderan and Khorassan. But the most singular tract of it is found occupying the shores of the Persian Gulph in the neighbourhood of Ormuz, not less remarkable for its immense thickness, than for its configuration and colour. It is presumed to be this deposit, from the gypsum and salt which it contains, and from its connexion with the sandy and salt deserts."* He then goes on to trace its distribution in America and Africa, and says, that here also we shall probably form a correct conclusion in considering the sandy deserts of these quarters of the world as appertaining to the same system.† That some deserts may derive their salt from saliferous systems is not at all improbable, but nothing is more erroneous or more incorrect to suppose, that this is generally the case.‡ Thus in the great Thurr or Indian desert, part of which separates the Bickaneer from the Bhawulpore territory, which was crossed by Elphinstone, who has given a graphic account of it, I have been informed by that active and talented officer, Lieutenant Robinson, Agent of the Bhuttee country, that in sinking the various wells in attempting to carry a road from Delhi through Hansi and Bickaneer to Bhawalpore, he has always found the salt in layers, or beds of soil of different thickness; here water was always salt or brackish, but after boring through this bed, another would be found devoid of salt, and the water below it fresh; but it only remains so for a short time, owing to the infiltration of salt water from the upper beds, and which has thrown much difficulty in his way in carrying out his plans. In a few parts of India, do we not meet with vast salt tracts unconnected with the saliferous strata? Thus in the Tirhoot district, Ambala district, Punjaub, &c.; nor on the other hand does it follow that those tracts, which occur in the neighbourhood of the saliferous system, are salt. Thus for instance, the finest soil in the Punjaub is that found between Jelalpore and Pind Dadur Khan, and it is well known, that no soil is worse adapted to cultivation than a saliferous one, it causing large tracts to remain waste; the only use of it being to obtain salt, which is either the carbonate, sulphate, or muriate of soda; nitre too is not uncommon.

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* Syst. of Geol. vol. ii. p. 229.

† Syst. of Geol. vol. ii. p. 230.

‡ M. Engelhard states, that there has lately been discovered in the salt mines of Hullin implements, and in such a position in regard to the beds of rock salt at present worked, as to lead to the conclusion, that deposits of salt have taken place since the commencement of the working of these mines, formed by the action of water on the previously existing beds of rock salt; and Professor Jameson remarks, that this fact is interesting in many respects, and affords a warning to geologists to be careful to distinguish between original and ancient deposits, and those of a very recent date formed by the action of water, and in an ancient formation. Edinb. New Phil. Journal, vol. xxviii. p. 420.

Alum Slate.—Next to the rock salt in economical value at Kalabágh is the alum slate, from which large quantities of alum (sulphate of alumina) is manufactured. In making it, there are fourteen manufactures engaged, with from 12 to 18 workmen in each. The alum slate which occurs in great beds alternating with the red marl, and containing beautiful twin crystals of selenite, is brought to the manufactories on donkies, at the rate of an anna per pucka maund.

Manufacture of Alum.—To procure alum, the following is the process adopted: first a layer of wood of about two feet in thickness is placed on the ground, above it a layer of alum slate of about the same thickness, which is sprinkled with water; the layers are continued successively for six or seven times, till the heap reaches to a height of from 25 to 30 feet; the wood is then lighted, and in the space of from 12 to 24 hours, the fire is extinguished. By this time the greyish black colour of the slate is converted into blood red. When cooled a thousand maunds of it are thrown into a brick tank, and mixed with as much water, where it is kept for three days, or until the water has acquired a deep red colour, the water is then let off into another tank, all the clay being left behind, and from it strained into a large iron boiler, and boiled for three or four hours until the quantity is reduced to a fifth; from this boiler after being cooled, when it is said to be cutcha, and mixed with two maunds of potash, it is conducted to another boiler, and then boiled till it is ready, which is ascertained by removing a small quantity, and if it then hardens into a solid mass it is considered so; when still hot, it is placed in red clay vessels capable of holding three pucka maunds, and after crystallizing the vessels are broken off, leaving an immense round mass of solid alum; it is not, however, quite pure, being of a red colour and semi-transparent; the colour is owing to the iron which it contains. This is the case with most of the alum which we have seen in the Upper Provinces. It is sold at 19 rupees and 4 annas the camel load of 6 maunds, (equal to 384 lbs.), of which however 2 rupees and 4 annas are exacted as duty by the Mallick. After removing the clay from the vat, it still retains the bright red colour, which attracted so much the attention of Elphinstone when there in 1809, who with the eye of a traveller thus notices it: "All the earth, particularly near the town (Kalabágh) is almost blood red, and this with the strange and beautiful spectacle of the salt rocks, and the Indus flowing in a deep and clear stream through lofty mountains past this extraordinary town, presented such a scene of wonders, as is seldom to be witnessed."* How long alum has been manufactured is uncertain, but from Elphinstone's observations, it appears to have been so, though he was ignorant of the circumstance, long before he visited the place.

Nitre.—It is not met with in the immediate neighborhood of Kalabágh; but the soil, from whence it is obtained, which is of a deep black colour, is procured about eight coss to the southward.

The Mallick of Kalabágh, (Ullah Yar Khan,) derives his income, amounting to Rupees 10,000 per annum, almost entirely from the mineral resources of the country. The salt trade, however, is monopolized by Raja Goolaub Sing, who only allows him to sell two boat loads, varying from 300 to 700 maunds per mensem. To the North-west but little salt is exported, as other mines in that direction occur.

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* Kingdom of Caubul, vol. i. M. Todd, page 59.

Mundi Salt Mines.—The similarity of the rocks met with at the salt mines in the Mundi country, North of the Sutlej, with those of Kalabágh, is too striking to pass unnoticed. The salt mines occur in a large bason, the fundamental rock of which is compact limestone (magnesian) of a blue or greyish colour, and abounding with layers of brownish black and greyish white hornstone. It rests upon a chloritic slate, which is only partially seen N. of the bason, where a broad trap dyke (greenstone,) partly compact and partly amygdalloidal cuts through them; the amygdaloidal cavities are either filled, half filled, or empty, with calcareous spar, quartz, epidote, &c. In many places the limestone is brecciated, but contains no organic remains; in others, it occurs in thin seams regularly arranged, or mixed up with each other in a confused manner, shewing, that some violent action was in operation during the time of its deposition. The hills, unlike those of Kalabágh, are covered with vegetation, rendering an examination of the relative position of the different rocks to each other intricate, particularly that of the trap to the Neptunian strata. All the rocks are highly inclined, the angle varying from 35° to 70°, and the dip W. and by N.

The marl in which the rock salt occurs varies exceedingly in colour, as at Kalabágh, being red, green, blue, white, &c. and forming hills which rise up in the form of peaks and needles to a height of three and four hundred feet. The needle-shaped formation is produced by the action of the weather, and is strikingly seen here, the rock being very soft and easily yielding to it; it is quite devoid of structure, and abounds with minute crystals of rock salt, which sparkle like diamonds.

Gypsum only occurs in small veins in the marl, and here and there we meet with drusy cavities, filled with specular iron ore, or small balls of iron pyrites, which when broken, present the radiated structure.

The mines of Darang, as those of Mundi are termed, are about 3,900 feet above the level of the sea. In 1839, these were worked, two closed and one open to the light of day. The first that we visited had been worked for three years, and was about two hundred feet in depth, one hundred and fifty of which were through red marl. To descend into it, there was a rude ladder, the steps of which were about 2½ feet distant from each other, and was divided into three divisions or stages, down which we were lighted by two miners carrying pieces of pine wood, highly impregnated with turpentine, causing it to burn with great brilliancy.

Method of working the Mines.—In working the mines, the most rude method is adopted, the only implements used, being large sledge hammers. The salt which is very compact and imbedded in the marl, and from 50 to 100 feet in thickness, is in all directions traversed by spouts made of the plaintain tree, (the only interior works,) which are used in conducting water to any part of the mine intended to be worked; it by degrees wears away a portion of the salt, and allows the miner to get at the remainder, which he breaks up with his large hammer. This is also the plan followed in working the mine open to day, (quarry,) the water being brought from a distance of about a mile. On enquiring if the water was kept, I was answered with a look of surprise, in the negative; it, from the latter mine, being carried by a winding stream to the Beyah. The salt is granular and very impure, containing a large per centage of iron and earthy matter. After working a mine for some time, they are obliged, owing to the quantity of water, to abandon it, and open one in another quarter, which owing to the softness of the marl rock, is easily done. Many mines were pointed out to us, which had, for the above reason, been lately abandoned.

This rude method of saving implements and manual labor, is unknown in Europe. In the Austrian mines, where the salt is very impure and invariably mixed with much clay, large chambers are formed in them, and filled with fresh water from the surface, which, attacking the sides and roof dissolves the salt, and leaves the clay and extraneous matter to settle at the bottom; after ten days or a fortnight, when the solution becomes sufficiently saturated, the brine is run off to the evaporating houses, and another supply of fresh water admitted; and this is repeated thirty or forty times, till the chambers become so extensive as to endanger the roof, and threaten destruction to the interior works. If this method was adopted at Mundi, which could be easily done, we would have salt equal, or rather superior, to that obtained at the Punjaub salt mines.

Method of removing Salt from the Mines.—In removing salt from the first mine, eight women and a boy were employed, who carried on each visit two cutcha maunds, (64 ℔,) to the godown, distant about half mile, and each individual removes from twelve to fourteen loads per diem. The salt is carried in conical-shaped baskets, the summit of the cone being downwards, so that when depositing it, all they do, is to bend the body forward, and allow it to tumble over their heads. Altogether engaged with the mines, there were 250 individuals, 200 of whom receive four rupees per mensem; the remaining fifty from rupees five to rupees fifteen, which brings up the expense of working the mines to rupees 2,000 per mensem. The sum drawn varies from 3 to 5,000, and the average per annum from rupees 35 to 60,000. The salt is sold at the rate of two maunds = ℔ 160 the rupee. A Paharee carries to Mundi, which is about twelve miles distant, 26 seers, 52 ℔, for which he receives two annas, or a third of its value. One half of the men are engaged at the mines, the other in exporting the salt to Mundi, Belaspore, &c.; but as its quality is so very inferior, but little is exported to the plains. It is occasionally brought down to Moubarickpore through Simla. There is another salt mine about fourteen coss to the northward, it yields, however, but a small quantity; viz. fifty maunds. Those of Durung yielding 300 maunds per diem.

In the cold weather, the miner works from 8 A. M. to 4 P. M., but in the morning they complain much of the cold, their only covering being a dirty piece of cotton cloth, similar to that worn by the miners in the Punjaub mines. Nearly the whole of the inhabitants of Durung are engaged in the mines,* a few only cultivating the fields around.†

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* By mistake the name of Vingul has been applied in some maps to the mines; the village of that name is about three coss off.

† To health, the employment of the miner here is equally injurious as at Jutaneh, &c., and the causes why it is so, opens up a wide field of investigation. Prior to the Niger Expedition leaving England, the subject of malaria attracted much attention. Dr. Daniel in a lecture delivered to the Royal Institution, maintained, that the dreaded malaria, as also the deadly stinking miasma of Africa, producing languor, nausea, disgust, and death, is owing to sulphuretted hydrogen. The jungle fever of India, is also ascribed to the same cause. On the Coast of Africa, the presence of the sulphuretted hydrogen is owing to the action and reaction of the vegetable matter carried down by the tropical rivers, and the sulphates always more or less present in the sea water. This, he proves to be the case experimentally. It is well known that the soils of the jungles of India abound with sulphates of soda and magnesia, must not therefore, he says, quantities of sulphuretted hydrogen be generated? Can science indicate a remedy for this evil? This the Professor answers in the affirmative; viz; fumigation with chlorine, by which a chemical action is instantly produced. Sulphur being thrown

All the rocks, as already mentioned, at Durung, like those of Kalabágh, are highly inclined, but they differ from each other in several essential points, though they, on the other hand, have many things in common. Thus the limestone and marl are mineralogically the same in every character; but in the former no organic remains are met with. Gypsum occurs in great abundance at the latter, and in small quantity in the former, where we have a chlorite slate and trap associated with the neptunian rocks, and with the marl there is a bed of bituminous marl slate, devoid also of fossils ; and the alum slate is wanting. The form in which the salt too occurs is different ; in the former in the form of a bason or hollow surrounded on all sides by older rocks, and in the latter forming strata with the surrounding rocks. The following Table, No. I, will illustrate the two formations :—

down, hydrochloric acid formed, and malaria and miasma destroyed. The Admiralty admitting the justness of Daniel's conclusions, has furnished the Expedition with chlorine, and no ship hereafter will proceed to that station without this purifier. Jameson's Phil. Journ. vol. 31, page 181.—It is a subject well worthy of the attention of the Indian Government. How often are the lives of soldiers proceeding through that malarious district, the Sunderbunds, destroyed by the effects of the miasma. In future no troops ought to be sent by water without having so much chlorine on board. It is also important to know, as has been proved by the experiments of M M. Melloni and Pazen, that a lighted cigar will in part counteract the bad effects of sulphuretted hydrogen when it exists in the atmosphere, a chemical action taking place, the products being sulphurous acid, water, and a few traces of sulphur. Phil. Journ. vol. 33, page 33.—Bischof in a letter addressed to the Friend of Africa, is inclined to call in question Daniel's statement as to the poisonous or miasmatous matter deriving its bad effects from the presence of sulphuretted hydrogen, but agrees with him in the advantages to be derived from the use of chlorine. Ed. Phil. Journ. vol. 33, page 32.—The cigar has been long appreciated in India by individuals travelling through jungly districts, but its value has only of late been proved experimentally.

No. I.

Saliferous System as represented in the Salt Range of the Punjaub and at Durung in Mundi, among the Himalayas, North of the Sutledge.

		1.—Saliferous System in the Punjaub Salt Range.						2.—Saliferous system at Durung in Mundi.			
		Subdivisions	Lithological characters.	Organic remains.	Localities.			Subdivisions.	Lithological characters.	Organic remains.	Localities.
Saliferous system.	5.	Alum slate,..	Earthy slate contains sulphate of alumina.	None, ...	Carabagh.	Saliferous system.		Bituminous marl slate,	Granular bituminous slate, ...	None, ...	Durung.
	4.	Red marl,....	Marl and sandstone of various colors, with imbedded rock salt, gypsum, coal, and mineral sulphur,.	None, ...	Jelalpore, Kalabagh, Buckrala, &c.			Red marl, ..	Marl of various colours, containing thin veins of gypsum, and great beds of rock salt,	None, ...	Durung.
	3.	Fossiliferous limestone; muschellkalk, ..	Granular or compact limestone, .	Eunomia, &c..	Carabagh.			None, ...	....	..	..
	2.	New red sandstone, ...	Red or grey sandstone, ...	Bones, teeth and coprolites of Saurians?	Jelalpore, Jutaneh, Kalabagh, &c.			None, ...	....	..	..
	1.	Magnesian limestone,	Compact grey or blue limestone, with imbedded hornstone, red & brown iron ore, .	Upper beds producta spirifer, gryphaea, nautilus, &c. ..	Jelalpore, Kotas, Carabagh, Cohat, &c.........			Magnesian limestone,	Compact grey or blue limestone, breciated, with imbedded hornstone, ...	None, ...	Durung.
							6.	Chloritic slate,	Granular slate composed principally of chlorite,	None, ...	Durung.

Revenue.—The revenue yielded by the Durung mines is small when compared with that of Pind Dadur Khan and Kalabágh, nor is there any chance of the former being much increased, owing to the nature of the salt, and the inaccessibility of the route for beasts of burden.. On the other hand, the latter will ere long assume a very different appearance. From Raja Goolaub Singh's people, who monopolizes not only the whole of the salt trade, but governs the greater part of the hilly country W. of the Jehlum, we could not get any definite information regarding the annual revenue yielded; we believe that it is not far short of fourteen lakhs. The time, however, is not far distant, we trust, that when the country comes under the rule of a liberal and enlightened Government, (which would be a subject of congratulation to the whole agricultural and commercial population,) to see it increased tenfold. The salt will not only supply the whole of Western India, but probably may be exported with advantage from Bombay, &c. The alum can be manufactured in any quantity, and it only requires encouragement and protection to increase this article equally with the salt. On the value of the gypsum, we have already commented. When a change therefore takes place in the government of this country, we shall no doubt see the town of Kalabágh raised to one of the most important in the Punjaub, although no coal has, nor shall be found worth working; but still we shall soon see another power brought into action in propelling vessels, which will do away with altogether the use of fuel; viz. electro-magnetism. Such being the case, we trust not but that important and vital object to the commerce of Central Asia, the opening of the river Indus to free trade, obtained by the advance of the British Army in 1838, will be duly appreciated, and recompense government for the outlay it caused. As soon therefore as this power is brought into play, we may expect to see the trade on this river rival that of its sister-river, the Ganges. But in opening up this river, another grand object has been obtained—a blow given to barbarism in Central Asia, and a way laid open to the advancement of European civilization.

As we ascend the river from Maree, which must be done in a boat, as there is no road on either side, we meet with highly inclined strata of sandstone, with beds of boulders of quartz, granite, syenite, trap, &c. (Fig. I. *d,*) dipping under an angle of 30° to the N. by E; in some places the boulders are six feet in diameter, and with their longest axis is always parallel to the dip of the strata. The same observation was made by Saussure in the Swiss Alps, where he observed conglomerates inclined, for the most part of an ovoidal-shape, and in the position mentioned. From this he inferred, and that too correctly, that such strata must have been formerly horizontal, each oval pebble having originally settled at the bottom of the water in this position. You sometimes meet the boulders, all of which are more or less smooth and rounded by attrition, lying in a different position from the one mentioned, which has been satisfactorily explained by supposing, that during their deposition they met with resistance, and the water therefore acting on them, gave them the position they now present; in other instances we meet with them arranged in single rows (Fig. 2. *b*,) or in beds alternating with the sandstone, or in only detached boulders (Fig. I. *e*,) yet having the above position. In fact, if a similar action as that which raised the sandstone strata forming the banks of the Indus, were now to be called into action upon the bed of that river, we would have a similar arrangement presented, and as the boulders generally lie in a N. E. or N. by W. direction, we are entitled to infer, that the current by which they were deposited flowed from these quarters, and that afterwards by plutonian action, the beds were raised to the position they now hold.

The sandstone which is generally of a white grey or greenish grey colour, more seldom red, (but in these beds alternating with the grey varieties,) in many places is so soft as to crumble under the finger. In it we also meet with contemporaneous beds of quartz rock (*c*) pointing out shifts that abound all along the cliffs, (See Fig. 2.) The cliffs in general have mural faces rising to a height of two and three hundred feet, presenting a very bold and rugged appearance; about a coss above Maree their height is greatest, and decreases as we ascend. Cutting through these, innumerable deep ravines are seen, exposing well the structure of the rocks. In all those places where the river is hemmed in by banks, it is very rapid and deep, as at Mukud and Sharkee, &c. This department has been ably investigated by Lieut. Wood,* who devoted much time in surveying the river.

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* Survey of the River Indus, Journal of the Asiatic Society.

Quartz Rock.—The quartz rock occurs in various modifications, either in beds, veins, or amorphous masses; in colour generally white or greyish white, and it being much harder than the sandstone, it stands out in bold relief.

Scenery.—The scenery on the banks of the river is uniform in the extreme, nothing being presented to the eye but bare, barren rocks, and white sandy beds, rendered more so by efflorescences of rock salt from springs, which issue from the banks in great numbers.

Gold-washing.—Between Attock and Kalabágh, about three hundred individuals are engaged in washing the sand for the gold it contains, which occurs in small flattened grains. They go in parties of seven and eight, and use eight different kind of implements; 1. *large wooden trough* for receiving sand; 2. *pick* for removing stones to get at the sand; 3. *shovel;* 4. *sieve.* On it the sand is thrown and washed through into the large trough with water raised by 5. a *wooden scoop*, which prevents any stones entering the trough with the sand—6, 7 and 8 are different kinds of wooden vessels for receiving the sand after being properly washed. It is then carried to their houses and mixed with a little mercury which attracts the gold, and by exposing it to heat, the mercury is driven off again and the gold left, which is sold at the rate of sixteen rupees per tola—four drams. A fourth of this, however, is exacted by the Mallicks. The washers seldom realize more than four annas per diem, generally about three annas, the gold extracted per day varying from one to two mashas, which is equal to the twelfth part of a tola. The sand which yields the gold, being that left after the washing, has in general a deep black colour, and is obtained in greatest abundance immediately after the river falls. The variety of gold is the purest gold—yellow gold.

Having examined the country beyond Sharkee, and meeting with nothing but the sandstone, we returned to Kalabágh, in order to proceed to Peshawur via Shuckardurrah, Elrichi, &c. As Wood and Burnes had mentioned the existence of coal in this direction, and as no person had made a geological examination of the country, we were desirous to ascertain whether the carboniferous series was to be met with in this direction.

On crossing the river at Maree, we ascended the Gossai nullah, which during the cold weather contains but little water, and proceeded in a

N. N. W. direction. The strata met with consists of sandstone and red marl, highly inclined, dipping to the S. S. W. under an angle of 60.°; succeeding to these, we find the boulder sandstone, also highly inclined, dipping S. E. by E. and presenting the same kind of structure as already noticed. In it thin seams of coal occur, similar to that met at Kalabágh. The road leading along the bed of the nullah becomes so very contracted, as to allow nothing more than a single laden camel to proceed at a time, the banks on either side rising to a height of several hundred feet, and nothing being seen but the blue vault of heaven. The first halting place is Cutchee, distant six coss. Here there is a small village and a spring of fresh water, which is rarely met with in this district. We encamped in a field, being one of the few seen, the country being bare and barren in the extreme. The rocks around are the red marl and sandstone, inclining S. S. W. under an angle of 60°. On leaving the bed of the nullah, we ascended a small sandstone hill, over which the road runs, and from whence begins the range that separates the Cohat from the Peshawur valley. Teera or Khybur range is seen, bearing N. N. W. And we have also a fine view of the snow-clad mountains beyond Caubul. From it we descended into the Chuppi nullah, which is the boundary mark between the Kalabágh and Shuckardurrah estates. A short distance onwards is Chushmah, so named from a spring of fresh water occurring.

Chushmah.—Here we halted, owing to the rugged nature of the country over which we had come; though the distance was only seven coss, we did not reach the encamping ground till the afternoon, having started at ten A. M. From Chushmah, the country gradually becomes more cultivated; at first we only see here and there a cultivated field on the side of the mountain, and all around a barren waste, these by degree increased in number, till we meet with open and extensively cultivated valleys; and so with the road, it at first being through small and contracted nullahs, these opening and leading through plains, separating which, there are several rugged passes, difficult for camels. Close to Shuckardurrah, there is a high hill named Oukini,* in the country of Russool Khan, from whence salt is obtained, and yields to him a considerable revenue. On the banks of a small stream near to it, sandstone occurs jointed, the joints being at right angles to the seams of stratification. On leaving Shuckardurrah, the route lies along the bed of the Turali river, in which we have the following interesting section. (Fig. III.) The rocks dip almost due south under an angle of 80°, and as we proceed, we meet with red, green, and grey sandstones, with the same dip and angle of inclination; and resting upon them in an unconformable position there is an immense bed of clay, about seventy feet thick, filled with boulders of trap, quartz rock, granite, &c. These strata continued onwards till a little beyond Shebicki, where we meet with fossiliferous limestone, which forms all the strata in the neighbourhood of Cohat. In the centre of the valley, a diluvial conglomerate is here and there seen cropping out.

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* Oukini Salt Mine.

Separating the Cohat from the Peshawur valley we have the Teera or Khyber range, as already mentioned. It rises a little below the fort of Attock, from the right bank of the river Indus, and runs in a Westerly direction till it meets the Solimaun ridge, south of Suffeid Koh, increasing in height as it proceeds onwards.* The Pass is about 1500 feet in height, very rocky, rugged, and steep, and about two coss in length. The rock consists of the same fossiliferous limestone as that met with in the valley of Cohat, and dips under an angle of 55° to S. W. Whether this rock occurs at the Northern side of the Pass we were not able to ascertain, as, on reaching the summit, we were driven back by the Afreedees, with the loss of several of our followers.

Springs.—At Cohat, the springs supply so much water, as to irrigate the whole of Sultan Mohamad Khan's country, which is about seven coss in length; their temperature was 84° Fah.; early in the morning, that of the air being 34° Fah. We returned from Cohat via Toghan, Gummut and Pehar; the country in many places being very wild and mountainous, the rocks met with similar to those already noticed, and recrossed the Indus at Honshialghur, where the sandstone with boulders is still found forming the banks of the river. The sandstone is continued on to Futeh Jung, and is superceded half way between this place and Hussun Abdal, by a nummulitic limestone. At Hussun Abdal, the whole district is composed of compact limestone. There is a lake on the summit of a mountain 12,00 feet in height, to the N. of the town, and is visited both by Hindoo and Mussulman pilgrims, each assigning his own reason for the appearance of the water.* As to Cohat and other places already mentioned, we have large springs issuing from the limestone rock. In proceeding towards Peshawur, we again meet with alternations of sandstone and limestone till we arrive at Attock, when we find a dark bluish-black or reddish-brown clay slate, and cutting through it on the W. side of the river there are beds of trap (greenstone,) which lead to the supposition, that the slate, which has many of the characters of a transition slate, is nothing but a metamorphic slate clay of the saliferous series, altered by the action of heat. This supposition is strengthened by finding it associated with rocks belonging to this series. It dips to the S. under an angle of 35° to 55°.

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* Elphinstone's Cubul, Vol. II. page 401.

Proceeding in a South-easterly direction from Hussun Abdal via Rawal Pindee, Manukeealla, Buckralla, and Rotus to Jehlum, we pass over strata first composed of limestone (magnesian,) succeeded by sandstone and red marl, which is well seen in the wild mountainous and rugged country extending from Buckralla to Kora, a distance of three coss, the route winding through a deep ravine, the mountains rising to a height of several hundred feet above it. The descent into this ravine is by a Pass, also several hundred feet in height, but which has been so levelled and formed by salient and re-entrant angles, as to allow a loaded camel either to proceed up or down. The rocks are red, green and white marls and sandstone, all highly inclined. On crossing the Jehlum, we pass over a few small hills, and composed of sandstone, probably of an age similar to that which contains the fossil organic remains found so well developed in the Sevalic range, between the Jumna and Sutledge, and from thence got into the open plain, the structure of which we have already noticed. With these remarks, we conclude our account of the Neptunian rocks, which form the strata of the salt range.

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* By the Hindoos it is said that Baba Nanuck struck the rock, and made the water come forth. By the Mussulman it is said that on Mullah Allee Moortuzza, the brother of the prophet visiting this place, the mountain advanced to meet him; on coming near to it, he ordered it to remain, and water issued forth from the place on which his hand rested, and several others. This happened about twelve hundred years ago !

Plutonian Rocks.—It is a remarkable fact, regarding the geological structure of this country, that though we meet every where, with the evidence of plutonian action in the disturbed, upraised, and altered state of the neptunian strata, there is only one locality where a plutonian rock is exposed; viz. at Attock. But probably the elevation of this range of mountains is connected with the great chain of the Hindoo Koosh. If so, it shews, that that system of mountains is as new as the saliferous series, and this is supported by the observations of Dr. Lord, who in company with Lieutenant Wood, ascended one of the highest Passes of that range.* That, however, plutonian action existed prior to the deposition of these strata, we are entitled to infer from the number and size of boulders, which are found imbedded in the sandstone strata, forming the banks of the river Indus, so that though the Hindoo Koosh, (which is a mere extension of the Himalayas, seeing that according to Humboldt they can be traced onwards to the volcanic Island of Formosa,) existed in the form of mountains; the position which it now presents was not attained till after the deposition of the saliferous series, and probably not till a later geological period, as we shall no doubt find many of the strata, which occur at the foot of the Himalayas, or among them, belonging to a much newer system; but to speak definitely, requires much further investigation, and at present we only can assert, that that range of mountains is newer than the saliferous series. Having now brought the first part of our report to a conclusion, it only remains for us to notice those individuals who assisted us in carrying on our investigation, to whom we are under great obligations. To Mr. G. Clerk, Governor General's Agent, we beg to return our best thanks. To him we are indebted for every thing. Through his interest and representation we received a most welcome reception at the court of Lahore, and means were put at our command of traversing the whole of his Highness Maharaja Shere Singh's dominions without molestation; and we cannot here pass unnoticed, the friendly reception that we every where met with in the Punjaub. When thrown into difficulties at Cohat, where I was obliged for sometime to take refuge in the fort of Sirdar Kadir Khan, Mr. Clerk again came forward with his assistance, and procured for me an escort of horse from his Highness the Maharaja.

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* McClelland's Calcutta Journal of Natural History, No. 4, in which a notice of Lord's Geological Observations has been given.

To Captain Mackeson, Political Agent at Peshawur, we beg also to return our best thanks, for procuring for us, through General Avitabile, protection from the Cohat chiefs, and for his hospitable reception on our arrival at Peshawur.

(Signed,) W. JAMESON,
AMBALA, 28*th June,* 1842. *On Deputation on the Indus.*

Barometrical Observations taken to ascertain the Altitude of the Station of Purulia, in the Ramghur District. By Capt. HANNYNGTON, 24*th N. I.* 1*st Assistant to the Governor General's Agent, Maunbhoom.*

In collecting the various documents relative to the Storm of 2nd and 3rd June 1842, which form the subject of my Seventh Memoir, I had occasion to solicit from Captain Hannyngton, to render his valuable report fully available for my purpose, the Barometrical correction for the difference of altitudes, and to obtain this more correctly, he requested me to obtain for him from Major Bedford, of the Surveyor General's Office, synchronous observations.

As every point of which the altitude can be thus determined, forms a valuable addition to our knowledge of the physical geography of India, I have requested Capt. H. to allow me to publish his results, which he modestly wished me to do in a foot note; but as it would much resemble putting a thing in the place least likely for it to be found when wanted, I have taken the liberty of making a separate, though brief, article of the observations, with his remarks.—H. PIDDINGTON.

The observations duly corrected were as follows:—

On 13th July, 1842.

	8 A. M			10 A. M.			4 P. M.		
	Bar.	Ther.		Bar.	Ther.		Bar.	Ther.	
		Alt.	Det.		Alt.	Det.		Alt.	Det.
Calcutta, ...	29·493*	81°	79.6	29.526	82°	81.5	29.450	83°	82.7
Purulia, ...	28.830	82°	80.0	28.835	83.5	81	28.795	84	82

NOTE—The observations at Purulia at 2 P. M. could not be depended upon.

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* Or 496.

By Mr. F. Baily's formula, each pair of the observations separately calculated give

8 A. M. Deduced altitude of Purulia,	... ...	663.62 feet
10 A. M. ... Do.	... .	694.23 „
4. P. M. ... Do.	... .	659.59 „
	Mean	672.48 „
The *Mean of the Observations* gives	.. ..	676.10 „
And the same by Hutton's method, ...	.. ..	674.77 „
	Final Mean	674.45 „

Hence we may suppose that Purulia is about 670 feet above Calcutta.

By reducing the Mean of the Barometers to the Mean Temperature at Calcutta, we have

Calcutta,	29.496
Purulia,	28.820
Diff.	0.676

I suppose this may be taken for the Barometrical equivalent. Indeed, it appears that within moderate limits, and under similar temperature, the Barometrical difference × 1000 = the difference of altitude between any two places in feet. It agrees very closely in this instance. I have not seen the rule so simply stated, but it is nearly true, and for the plains of India perhaps sufficiently so. The logarithmic rule is, however, easy enough.

Brigadier Twemlow, *on Artificial Fuel. Received from the Agricultural Society.*

To the Secretary to the Agricultural and Horticultural Society of Calcutta.

Ellichpoor, 30th August, 1841.

Sir,—With reference to the notice contained in my letter of the 2nd instant, regarding clearing forest lands for cultivation, whilst making a substitute for coal, I have the honor to state, that this is a subject which I endeavoured to bring into notice so far back as the month of August of the year 1833, (copy of letter annexed.)

The following are some of the ingredients which might, I conceive, be mixed with charcoal, or inferior coals :—

1st. Bitumen, Pitch, and Tar, (obtained when burning the charcoal in inclined cylinders or furnaces.)

2nd. Oils, a small quantity of lime added to give packing consistency.

3rd. Gum Resins, extracts from Cactus and other Milky Plants and Trees, and Unctuous Clay.

4th. Seeds of Cotton ; Oil Plants ; refuse of Mills ; of Distilleries ; Fecula of Flax, Hemp, Indigo, &c.

5th. If the properties or smell of the above are objectionable, the mode adopted with success by the natives of India generally, for making charcoal fire balls for hookahs, by using the starch of rice or other grains might perhaps be the best, as most universally practicable.

Once made an article of commerce, the pressed charcoal, whether in bricks, balls, or blocks, would be brought to the coast by Binjurrah Tandahs* going down to the coast for salt and other articles ; the turbulent hill tribes,† would without being aware of it, cut down their at present almost inaccessible forest dens of refuge ; and lands once covered with rich cultivation, such as those near the Taptee and other rivers, would again put on the garb of civilization, instead of being, as at present, the resort of the bison, the wild dog, sheep, and goat.

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* Tandah, a community of Binjarrah ; some having a thousand head of cattle.

† If the Bheel corps had each a company of Miners and Pioneers attached, discoveries, mineral and geological, would follow. The cave-making Ancients found their advantage in such excavations.

If it should be objected, that by exhausting the forests, the want of fuel would cause inconvenience, the reply would be, the more this is felt, the more search will be made, (and there can be no doubt with success,) for *coal*, of which nature in all probability has provided in India an ample supply.*

Search is making in Berar for coal. The sandstone,† indurated clay with fossils,‡ limestone, salt beds,§ give hope. The hills near Guwilghur, after rain, have the shining black sand (found wherever gold exists,)|| in all the courses for water on the laterite plateaus overlying the trap and basalt. The limestone is in ridges at the base of the hills to the south, and generally outside (though much intermixed with) the sandstone. The space between the outer ridge of limestone, and the inner of sandstone, would appear, with reference to its height above the valley of Berar, admirably adapted for lakes of irrigation or reservoirs to feed canals; but this is looking perhaps, too far forward.

I have the honor to be, Sir,
Your obedient humble servant,
GEORGE TWEMLOW, *Captain*,
Bengal Artillery.

COPY FORM LETTER BOOK.

To the Secretary to the Steam Committee, Bombay.

Aurungabad, 9th August, 1833.

SIR,—Permit me to suggest to the Committee, that in the event of "coal" not being procurable in sufficient abundance in India, an arti-

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* When renewing the bund of the lake below the caves of Ellora, I had to dig very deep for foundation; an unctuous black mud deposit prevailed deep down, which would I conceive in course of ages, have assumed the consistency of coal. All the charcoal dust from the periodical burning of the hills had washed towards the bund, in all probability, and this mixed with fecula of fish, vegetables, &c may have caused the appearance of the mud alluded to.

† The sandstone in all degrees of induration and cementation may be seen five miles North of the cantonment of Ellichpoor in contiguity with limestone and indurated clay; the sandstone distinctly stratified, but subverted as if heaved up.

‡ To be seen at Mokhtagherry, six miles North East of the cantonment of Ellichpoor.

§ Salt beds. Cattle thrive in Berar from the *salt* leeks. Salt is made rudely, by evaporation, at a village beween Omrouttee and Ellichpoor.

|| Shining black ore, perhaps sulphuret of iron? Some of this has been sent in a letter to the Curator of the Museum of Economic Geology, to be tested. It was the common titanifirous Iron sand of India.—H. P.

ficial substitute for it might be made, where forests exist near the Coast, by mixing bitumen and pounded charcoal, (or in the interior of India cow-dung, clay and charcoal,) with a proportion of the unctuous mud used by the natives in making their "Ooplees."

The mixture to be moulded into the shape of *bricks*, and pressed by a powerful screw and lever, of a simple construction, into the smallest possible space, consistent with suitable ignition.

Refuse oil cakes might be a cheap substitute for bitumen. If this sort of brick should be found to answer, it might soon be made an article of commerce, and be prepared in every village, and in every Binjurrah camp within reach of the Coast; and the sooner to bring it about, natives might be deputed to make small advances, and to teach the mode of making the compound.

I have, &c.

(Signed) GEORGE TWEMLOW.

The same sent to Calcutta.

Refuse oil cakes called kullee, sell at Aurungabad at half rupee for 240 ℔.—Charcoal 9 Rs. for 1600 ℔.

The above is copied from Captain Twemlow's letter book; but the originals may somewhat differ, and the former materials possibly may not have been given in the letters.

The only object in sending this copy, of an old letter, is to remove any objection to interference with patents subsequently obtained for exclusive manufacture of artificial coal, whether in England or elsewhere. The "gool" makers of India have for ages made carboleine for hookas.

GEORGE TWEMLOW.

Ellichpoor, August 30, 1841.

Memorandum of 1841.

If the upper seams of coal of the present mines can be improved by admixture, this might lead to working to better coal. The water thrown up by Steam engines at the pits should be carried by channels of irrigation over land *owned by the Company working the mines.* A terraced road to the nearest navigable river might be so constructed, as to answer in the *centre* for locomotive carriages, the *sides* for channels of irrigation. Steam engines at the heads of successive levels throw up water; the terrace in this way if occasionally submerged, would attain great hardness, in fact be silicified in course of time in all probability. All road-making should be done conjointly with facilities for water; the supply of the four months is ample for the twelve if retained, instead of being permitted to run waste, and carry off soil, filling up rivers.

A Companion to the Moon Table, by CAPT. SHORTREDE, *1st Assistant* G. T. *Survey.*

In order to have the times of true as well as of mean, new and full moon, I have constructed the present as a companion to the moon table, by means of which the corrections to be applied may be found to be less than half an hour of the truth.

The term syzygy (the same radically as संयुग conjunction) being used to denote indifferently the conjunction of new or full moon, it is obvious, that as at a syzygy the moon must be in line with the earth and sun, the first correction of the mean to the true time will be that arising from the unequal apparent motion of the sun in its orbit depending on the sun's anomaly. This correction which at its maximum is about 10 minutes more than 4 hours, may be taken at once from the back of the card to within a few minutes of its true amount. As the anomalistic year exceeds the tropical by 25m. 07.2s. and the Julian by 13m. 58.8s., the relative position of the two circles on this card ought properly to be shifted by corresponding quantities, amounting to about 1 day in 57.3 years in N. S., or 103 years in O. S.; but as this can very easily be taken account of, I have thought it unnecessary to provide for it by a moveable card. If the moon table were provided with a vernier, or other means to admit of being read with certainty and ease to within an hour, it might be worth while to add here a moveable card; but for the present these considerations give way to convenience.

The following tables shew the position of the marks on the outer and inner circles (in half days,) for the Epoch, 1st January, 1800.

h. m.	+		—	
0.00	00.00	27.50	27 50	55.00
10	0.34	27.14	27.86	54.66
20	0.69	25.78	28.22	54.31
30	1.03	26.42	28.58	53.97
40	1.38	26.06	28.94	53.62
50	1.73	25.70	29.30	53.27
1.00	2.08	25.33	29.67	52.92
10	2.43	24.96	30.04	52.57
20	2.79	24.59	30.41	52.22
30	3.16	24.21	30.79	51.84
40	3.53	23.82	31.18	51.47
50	3.91	23.43	31.57	51.09
2.00	4.29	23.03	31.97	50.71
10	4.69	22.62	32.38	50.31
20	5.10	22.19	32.81	49.90
30	5.52	21.73	33.24	49.48
40	5.96	21.30	33.70	49.04
50	6.42	20.83	34.17	48.58
3.00	6.90	20.33	34.67	48.10
10	7.42	19.80	35.20	47.58
20	7.98	19.23	35.77	47.02
30	8.51	18.61	36.39	46.49
40	9.26	17.92	37.08	45.74
50	10.00	17.11	37.89	45.00
4.00	11.05	15.07	38.93	43.95
10	13.56	13.56	41.44	41 44

	1	6	11	16	21	26
January,	0.10	0.85	1.61	2.36	3.11	3.87
February,	4.77	5.52	6.27	7.03	7.78	8.54
March, ...	8.99	9.84	10.50	11.25	12.00	12.76
April, ...	13.66	14.41	15.17	15.92	16.67	17.43
May, ...	18.18	18.93	19.69	20.44	21.20	21.95
June, ...	22.85	25.61	24.36	25.11	25.87	26.62
July, ...	27.37	28.13	28.88	29.63	30.39	31.14
August, ...	32.05	32.80	33.55	34.30	35.06	35.81
September	36.72	37.47	38.22	88.98	39.73	40.48
October, ...	41.24	41.99	46.74	43.50	44.25	45.00
November	45.91	46.66	47.41	48.17	48.92	49.67
December	50.43	51.18	51.93	51.61	53.44	54.19

The next correction, and the only other here requiring to be taken into account, is that depending on the moon's anomaly; and whether the mean or true anomaly be used matters little; that is to say, whether we use the mean time given by the moon table, or first apply the above correction; the latter mode, however, is the more proper to be followed.

The period of an anomalistic revolution is 27d. 13h. 18m. 35s., which (for reasons similar to those for the lunation) is here reckoned as 27½ anomaly days, each being 171.455s. of mean time longer than a solar day, which latter is 171.115s. of anomaly time short of an anomaly day.

In 13 revolutions of the anomaly, there are 358d. 5h. 01m. 35s. being short of a Julian year of 365¼ days by 7d. 0h. 58m. 25s. which may be called the Julian anomaly Epact. This being reduced at the rate of 171.115s. daily, becomes 7d. 0h. 38m. 20.25s. = 7d. 026623 = 14.053246 half days. The common and leap year Epacts may therefore be taken as 13.55325 and 15.55325 half days respectively, and their places on the outer card will be as in the annexed table. The

Year.	Place on the card.	Year.	Place on the card.	Year.	Place on the card.	Year.	Place on the card.
00	00.00	01	13.55	02	27.11	03	40.66
04	1.21	05	14.77	06	28.32	07	41.87
08	2.43	09	15.98	10	29.53	11	43.09
12	3.64	13	17.19	14	30.75	15	44.30
16	4.85	17	18.41	18	31.96	19	45.51
20	6.07	21	19.62	22	33.17	23	46.73
24	7.28	25	20.83	26	34.39	27	47.94
28	8.49	29	22.05	30	35.60	31	49.15
32	9.71	33	23.26	34	36.81	35	50.37
36	10.92	37	24.47	88	38.03	39	51.58
40	12.13	41	25.69	42	39.24	43	52.79
44	13.35	45	26.90	46	40.45	47	54.01
48	14.56	49	28.11	50	41.67	51	0·22
52	15.77	53	29.33	54	42.88	55	1.43
56	16.99	57	30.54	58	44.09	59	2.65
60	18.20	61	31.75	62	45.31	63	3.86
64	19.41	65	32.97	66	46.52	67	5.07
68	20.63	69	34.18	70	47.73	71	6.29
72	21.84	73	35.39	74	48.95	75	7.50
76	23.05	77	36.61	78	50.16	79	8.71
80	24.27	81	37.82	82	51.37	83	9.33
84	25.48	85	39.03	86	52.59	87	11.14
88	26.69	89	40.25	90	53.80	91	12.35
92	27.91	93	41.46	94	0.01	95	13.57
96	29.12	97	42.67	98	1.23	99	14.78
1.00	28.33 30.33						14.78

double mark for leap year being inconvenient to put upon this card, is omitted; its place is supplied by a double mark for January and February on the month card.

In 1325 anomalistic revolutions, there are 36509d. 19h. 22m. 55s., being less than a Gregorian century by 14d. 4h. 37m. 05s., and than a Julian by 15d. 4h. 37m. 05s. These centurial Epacts reduced as above, became in half days 28.329 and 30.325 respectively, or 28.33 and 30.33 nearly enough.

With regard to the position of the full century marks on the middle cards, we have

	° ′ ″
Moon's mean longitude on 1st January 1801,	111.36.42.1
Mean longitude of moon's perigee do.	246.06.05.1
.·. Moon's mean anomaly on 1st January 1801, is	205.30.37

This corresponds to 15.7404 anomaly days past the perigee, which adding .0065 for the difference between Paris and Greenwich, gives 15.7469d.; and subtracting a common year Epact=6.777, we have 8.97d. for 1st January 1801, in civil time at Greenwich, or 17.94 half days as in the following table.

nt.	N. S.	O. S.	or —	nt	N. S.	O. S.	B. C.
0	50·00	46·00	46·00	20	21·60	47·60	44·40
1	23·33	21·33	15·67	21	49·93	22·93	14·07
2	51·66	51·66	40·34	22	23·26	53·26	38·74
3	24·99	26·99	10·01	23	51·59	28·59	8·41
4	0·33	2·32	34·68	24	26·92	3·92	33·08
5	28·65	32·65	4·35	25	0·25	34·25	2·75
6	1·98	7·98	29·02	26	28·58	9·58	27·42
7	30·31	38·31	53·69	27	1·91	39·91	52·09
8	5·64	13·64	23·36	28	32·24	15·24	21·76
9	33·97	43·97	48·03	29	5·57	45·57	46·43
10	7·30	19·30	17·70	30	33·90	20·90	16·10
11	35·63	49·63	42·37	31	7·23	51·23	40·77
12	10·96	24·96	12·04	32	37·56	26·56	10·44
13	39·29	0·29	36·71	33	10·89	1·89	35·11
14	12·62	30·62	6·38	34	39·22	32·22	4·78
15	40·95	5·95	31·05	35	12·55	7·55	29·45
16	16·28	36.28	0·72	36	42·88	37·88	54·12
17	44·61	11·61	25·39	37	16·21	13·21	23·79
18	17·94	41·94	50·06	38	44·54	43·54	48·46
19	46·27	17·27	19·73	39	17·87	18·87	18·13
20	21·60	47·60	44·40	40	46·20	49.20	42·80

The hour marks on the inner circle of the middle Card stand thus—

H. M.	Place of mark on Card. —	—	+	+
0·00	0·00	27·50	27·50	55·00
1.	0·96	26·66	28·34	54·04
2.	1·94	25·83	29·17	53·06
3.	2·94	24·96	30·04	52·06
4.	3·98	24·07	30·93	51·02
5.	5·05	23·12	31·88	49.95
6.	6·20	22·10	32·90	48.80
7.	7·46	21·01	33·99	47.54
8.	8.93	19·66	35·34	46.07
9.	10·73	17·89	37·11	44.27
9.48	14·33	14·33	40·67	40.67

The division lines and marks on the three cards being not continuous in these as in the week-day table, a silk thread is attached to them, in order to facilitate the bringing of the proper marks on the cards correctly into line. With the same view, the month marks have been projected on the circle separating the months and days. These marks are so small, as not to attract attention unless particularly looked for.

The method of using and manipulating these moon tables is so perfectly analogous to that formerly detailed for the week-day table, that beyond the directions on the face of the cards, nothing more seems necessary. An example or two may suffice. Required true time of full moon in October 1841, the 18 on the outer circle of the middle card being set to ●● on the outer, and the mark for October brought in line with that for the current year 41; the full moon mark ○ falls almost exactly on the line between 29 and 30, hence the time of mean full moon is on the 30th at 0h. A. M. For this date, the back of the *Companion* gives 4.18h. to be ***subtracted:*** then for 1841 October, 29d. 8h. P. M. the face of the *Companion* gives 9.47h. to be *added:* the time of ***true*** full moon is thus the 30th at 5h. 29m. A. M. To which adding 5h. 54m., as the diff. of longitude between Greenwich and Calcutta, we get 30d. 11h. 23m. A. M. as the time at Calcutta. I have not at present the means of comparing with the Nautical Almanac, but the old tables, supposed to be Ferguson's, give 30d. 0h. 03m. 31s.* the difference being about 40 minutes.

The month marks on the inner Card stand thus—

	Common.	Leap.
January,...	0·00	2·00
February,	48·12	50·12
March, ...	47·24	
April,	40·36	
May,	45·48	
June, ...	28·60	
July, ...	23·72	
August, ...	16·84	
September, ..	9·96	
October,......	5·08	
November, ..	53·20	
December, ..	48·32	

An Eclipse of the sun is said to have been seen at Babylon in March 721, B. C.$=\bar{8}.80$ O.S. Now 8, being set to ●●, and March in line to 80, mean new moon was about 20d. 2h. A. M. $\frac{721+1800}{103}=24.5$, to which add 12 days for diff. of styles and 20th March+36 is 5th April, for which date the first Equation is+4.08m. and this applied to 20d. 6h. gives 20d. 6h. 08m. A. M. and for this date year $\bar{8}.80$, the *Companion* gives the 2d Equation+9h. 30m., and this gives the true time 20d. 3h., 38m. P. M., and adding 3h. for diff. of longitude, the time of new moon

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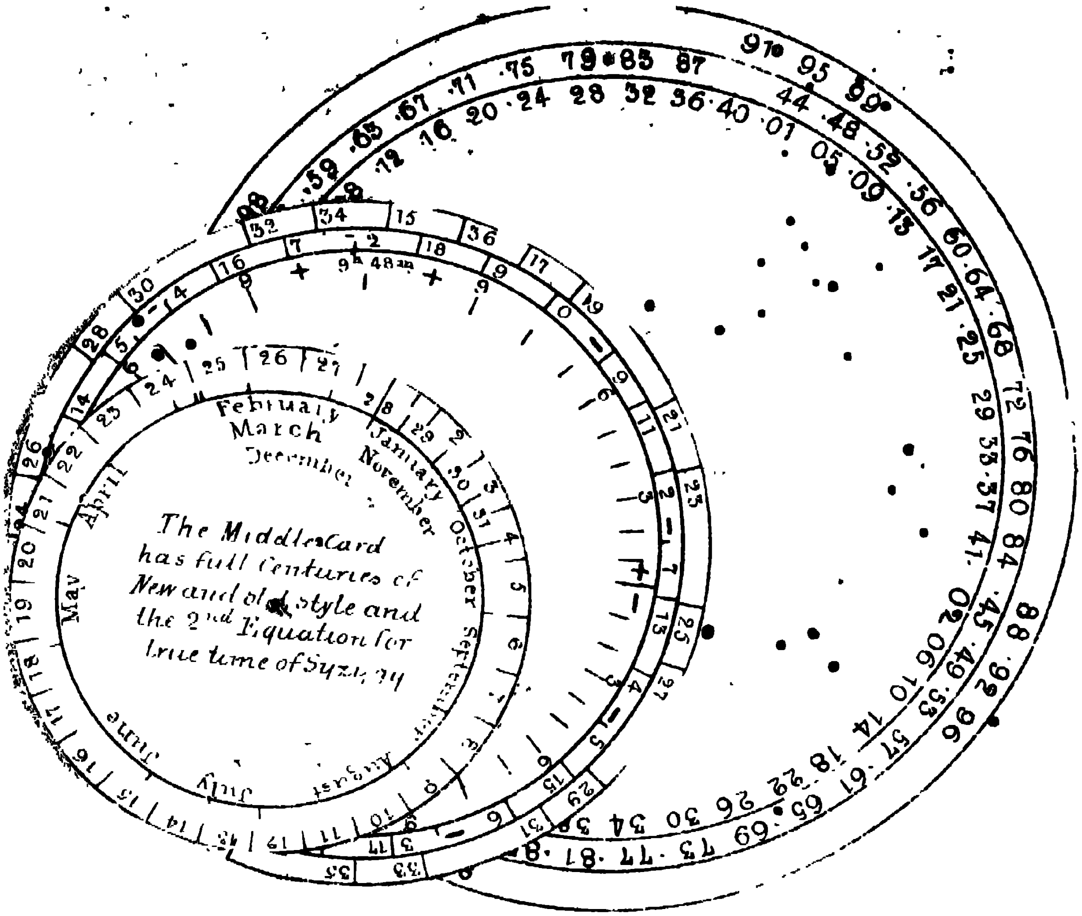
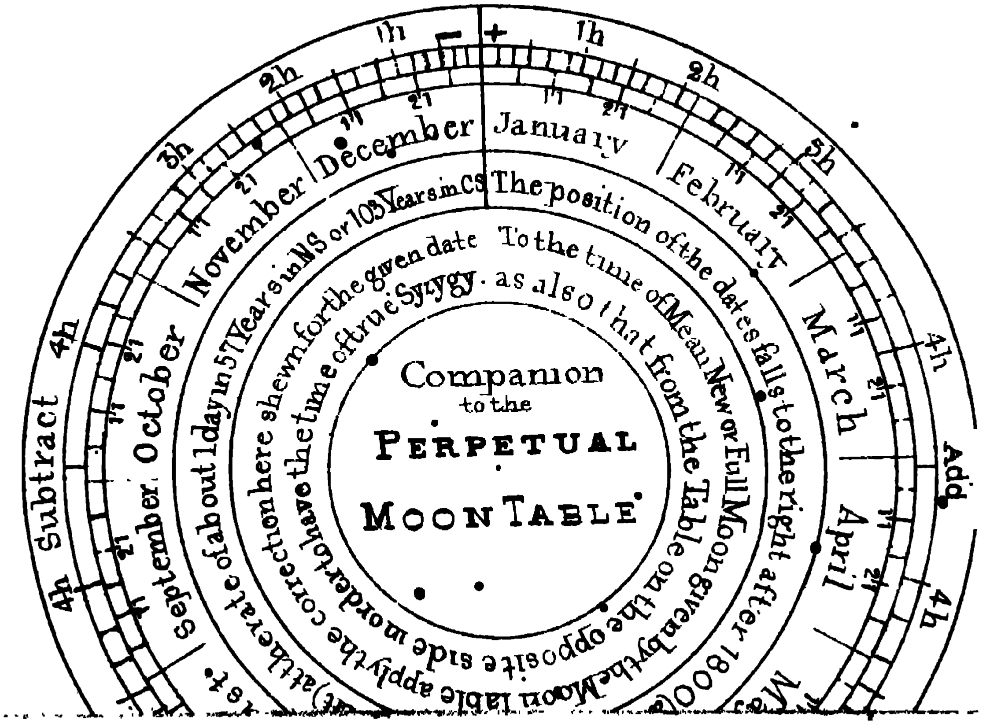
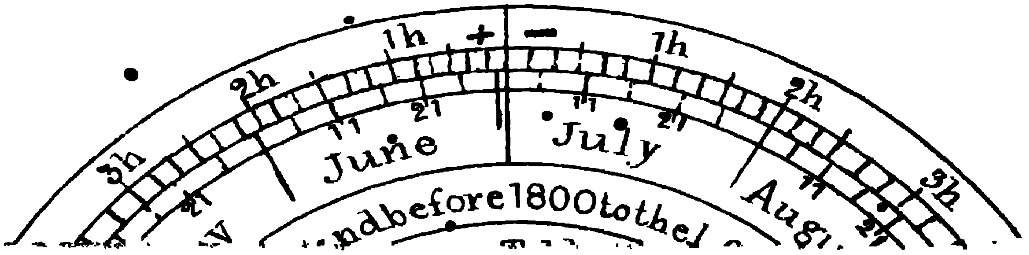
* The Almanac in Rushton's work gives a day earlier by some mistake, which (or 12 hours) appears to run through every month of the year.


The Middle Card has full Centuries of New and old style and the 2nd Equation for true time of Syzygy
February
March
December
January
November
October
September
August
July
June
May
April
9h 48m


Companion to the PERPETUAL MOON TABLE
The position of the dates falls to the right after 1800
at the rate of about 1 day in 57 Years in NS or 105 Years in CS
To the time of Mean New or Full Moon given by the Moon Table on the opposite side in order to have the time of true Syzygy, as also that from the Table
apply the correction here shewn for the given date
January
February
March
April
May
September
October
November
December
Subtract
Add
1h
2h
3h
4h


3h
2h
1h
+
−
1h
2h
3h
11
21
June
11
21
July
Aug
11
21
ndbefore1800tothe

at Babylon in March 701, B. C. becomes 20d. 6h. 38m.; hence, to have been visible, the Eclipse must have happened at sun-set.

Required the day of full moon in March 1720, B. C.? The moon table gives at once 24d. 10h. A. M., and applying the Equations from the Companion, we find 24d. 7h. P. M. and 3h. for diff. of long. gives at Babylon 24d. 10h. P. M. It is therefore altogether a mistake to say, as is said in Rushton's work, that an Eclipse of the moon could have occurred on the 19th of March, 1720 B. C. Even had the date been correct, the moon was upwards of 65° from the node when full in March 1720 B. C., when of course an Eclipse was out of all possibility.

It is obvious that these tables may be useful in many cases to nautical men, who have occasion to know the time of high water at a port. They may be useful also to the traveller, who wishes to know when he will have moonlight. Europeans, who have occasion to know the common native date may find them of good use. Perhaps also the Joshis may find them useful in making their Almanacs, as the *Companion* with its principal will shew what तीथि are क्षय and what are आधिक more correctly, and with vastly less trouble than the methods now in use.

November, 1841.

Account of a luminous Meteor seen at Charka, lat. 24° 06′, *long.* 81° 02. *on the morning of the* 11*th April* 1842, *By* CAPT. SHORTREDE, 1*st Assistant G. T. Survey.*

A little before 4 o'clock this morning, I saw a meteor of a singular appearance, of which the following is an account :—

I was lying awake outside my tent, and about a minute or two before had closed my eyes, intending to have a short sleep before marching, when my attention was roused by some brilliant light before me. On opening my eyes, I saw a meteor having very much the appearance of a rocket: it was situated in the constellation Scorpio, having its middle about 10° to the westward of Antares, and pointing towards the constellation Corvus, the lower star of which was about 4° above the horizon. The meteor was about 10° or 20° long, and equally bright throughout, except at the upper end, where it was rather faint. It continued in the same position, and of the same brightness for between 2 and 3 minutes as well as I could judge, and then gradually became fainter and fainter, till it lost its brilliancy altogether: and as it began to fade, it began also to become crooked, and to move towards the west. It became gradually more crooked, and continued to fade till it became like a thin smoke, and at last vanished away at about 3° or 4° from the place where I first saw it. I listened attentively, but heard no noise. From the time I first saw it till its brilliancy ceased, was probably about 5 minutes, and in about 3 minutes more it ceased to be any longer remarkable.

I was then at Charka, in lat. 24° 06′ and long. 81° 20′.

Dewra, 11th April, 1842.

Analysis of Iron Ores from Tavoy and Mergui, and of Limestone from Mergui. By Dr. A. URE, *London. Communicated for the Museum Economic Geology of India, by* E. A. BLUNDELL, *Esq. Commissioner, Tenasserim Provinces.*

On the right bank of the Tavoy river, opposite the town of Tavoy, runs a range of low hills at a distance from the river varying from one and a half to three miles, formed apparently of magnetic iron ore. The range extends a distance of five or six miles. At about its Northern extremity, on the summit of a hill about 150 feet in height, is found the large projecting rock mentioned in page 28 of Dr. Helfer's Second Report. This rock is about one and a half mile distant in a direct line to the bank of the river, to a spot itself distant about three miles North of the town of Tavoy. This large rock is highly magnetic on its Northern side. (According to the expression of the natives, it is alive on its Northern and dead on its Southern side). The hill appears entirely formed of this ore, and at the bottom of it are to be found the rolled masses of from two to twenty lbs mentioned by Dr. Helfer. Between the hill and the river are rice fields, through which runs a small nullah, and having between the hill and the fields about quarter of a mile of high ground well adapted for buildings, and on which high ground are found the rolled masses or boulders above alluded to.

The nullah can convey boats of three to four tons, half way through the rice fields. The same description answers for the whole extent of the range of low iron hills, having here and there small nullahs, communicating with the river. This ore was once worked by the Burmese during the time of an expedition against Siam, for iron to make swords, knives, spears, and other weapons. People were sent from Ava to smelt it, but the process appears unknown to the Tavoyers. There are still to be seen the pits in which it was smelted, with the scoriæ around the edges. The quantity of the ore appears inexhaustible.

Limestone is procurable in the province, and no doubt many localities of it will be discovered. The only one yet properly ascertained exists about fifteen miles to the Eastward of Tavoy, accessible by water to within a distance of two miles by small boats of half ton burthen. Between the locality and the stream, the land is level and high, affording facility for a road. The quantity is abundant.

Charcoal may be made with ease, owing to the abundance of excellent wood in the country adapted to it.

No. 1.—Pieces of ore knocked off the large rock mentioned by Dr. Helfer, in page 28 of his Report.

No. 2.—Pieces of ore dug up in the neighbourhood of the above large rock.

No. 3.—Rolled masses of iron ore picked up on the high ground, between the hill and the rice field.

Mergui.—About 10 miles S. W. of the town of Mergui, is an island, comprising a hill about 200 feet in height, formed apparently of iron ore. The island is perfectly accessible to boats of every description, and you land on large masses of rock, which prove to be the iron ore from which the soil has been washed away. The hill rising abruptly from the water, may be about a mile in circumference, and is wholly formed of the ore, having a rich bed of soil. A similar island, equally accessible, is formed about four miles to the Southward of the one above mentioned. It is not known that this ore has ever been worked, and the process seems unknown to the people of Mergui.

Limestone is found in several accessible localities on the main branch of the Tenasserim river, not far above the old town of that name. Specimens accompany the iron ore.

No. 1.—Boulders of iron ore picked up at the landing place of the island above mentioned.

No. 2.—Pieces knocked off large masses at landing place.

No. 3.—Pieces dug up on the hill.

No. 4.—Specimens of limestone.

London, 13, *Charlotte Street, Bedford, Square,* 26*th Nov.* 1842.

I have now the pleasure of handing you the details of my examination and analysis of the several ores of iron and the limestones from Tavoy and Mergui, with which I have been almost constantly occupied during the last fortnight.

1st. Compact magnetic iron ore..—Tavoy, No. 1.

Colour iron black with a metallic glimmer, fracture fine grained, possesses magnetic polarity, specific gravity 3.511, compared to water = 1,000.

It yields in analysis the following constituents:

Peroxide of iron	86·5	equivalent to 60·55 metal.
Silica with a trace of phosphate of lime, ...	3·5	
Water, ... — ...	10·0	
	100.0	

It contains no manganese or titanium.

2d. Compact magnetic iron ore.—Tavoy, No. 4.

External and Magnetic characters as above.

Specific gravity, 3·462.

It yields in analysis:

Peroxide of iron	86·0	equal to 60·2 metal.
Silica with a trace of phosphate of lime, ...	0·9	
Water, ...	13·1	
	100·0	

It contains neither manganese nor titanium.

3d. Tavoy ore, No. 2.—External characters as above.

Specific gravity, ... 4·369.

4th. Tavoy ore, No. 3.—Characters as above, as to aspect and magnetism.

Specific gravity, 4·100.

The two latter samples are even richer than the former; as is evinced by the specific gravity, but they are all quite rich enough and pure enough for making the best quality of bar-iron and steel.

I instituted two elaborate sets of experiments in search of titanium, which when present in any notable quantity in iron ores, renders the iron made from them red-short, but I found none in the above ores. In the first set of experiments I treated the ore as follows: I added to its solution in nitro-muriatic acid, so much tartaric acid as to render all the oxides unprecipitable by ammonia. I next added ammonia in excess, and afterwards hydro-sulphuret of ammonia, which throws down all the metals except titanium. The whole being thrown upon a filter, afforded a colourless liquid which evaporated to dryness, and carefully ignited in a platinum cup, left no trace of titanic acid, which it would have done, had any of that metal existed in the ore.

The second set of experiments for titanium consisted in transmitting sulphuretted hydrogen in excess through the nitro-muriatic solution of the ore, in then adding ammonia in excess, the effect of which is to precipitate both the iron and titanium. But the precipitate when digested with sulphurous acid, has its iron dissolved, while the titanic acid will remain undissolved as a white powder. By this means also no distinct evidence of titanium could be obtained.

5th.—The limestone from Tavoy has a specific gravity of 2·7, and is a perfectly pure, semi-crystalline carbonate of lime, akin to statuary marble. It is well adapted to act as a flux in the smelting of iron.

The three samples of iron ores from Mergui, are brown hematites, and from their density, will afford good iron in the smelting furnace.

6—Mergui iron stone No. 1 specific gravity 3.37.
7 Ditto. Ditto. 2 Ditto. 3.18.
8 Ditto. Ditto. 3 Ditto. 3.32.

The limestone of Mergui has a specific gravity of 2.7; it is a pure calcareous carbonate. I analyzed both the limestones.

I am, dear Sir,
Yours truly,
(Signed) ANDREW URE.

Supplement to the Monograph of the Indian and Malayan species of Cuculidæ, or Birds of the Cuckoo family, published in Vol. XI, pp. 898, 1095, *et seq. By* Edward Blyth, *Curator of the Asiatic Society.*

Having received some annotations on my paper on *Cuculidæ* from Mr. Jerdon, and been favoured by Dr. McClelland with the loan of the *Zoologie du Voyage de M. Bélanger*, which has set me right with regard to the names of certain species, besides furnishing some other information concerning them, and having likewise learned one or two other facts worthy of publication, I shall not longer postpone the preparation of an Appendix to that paper, but proceed at once to its revision.

Accipitrine Cuckoo; *Cuculus sparverioides*, Vigors and Gould. In Southern India, writes Mr. Jerdon, this species is "only found in the dense woods of the summit of the Neilgherries. It is seldom seen except when the woods are beaten for Woodcocks, and quits the shelter of the wood with reluctance. I never heard its note. Flight rapid. Stomach filled with caterpillars."

Whistling Cuckoo; *C. fugax*, Horsfield. The same observer continues —"Besides the Hindustani name given in my catalogue, its name in Teloogoo is *Kuttee pitta*, *i. e.* 'Sword-bird,' given, it is said, from its peculiar and rapid flight. It is stated by the Shikarees to deposit its eggs in the nest of the Shikra! *(Astur Dussumieri)*, which it so much resembles in colour. In the Deccan it is sometimes named *Zuk-kat* or 'Custom-house bird'." In Bengal, the young of this bird are far more numerous in open jungles than the Hawk mentioned, but I have not yet observed any particular species feeding them.*

C. Sonneratii. "Only found in dense forest-jungle." Jerdon.

C. niger. "Dispersed over all the peninsula wherever there is much shelter. At Hydrabad I saw one of this kind *in the grey plumage* sitting on a trellis work in a garden expanding its wings continually, and close to the spot where it sat and within view was a nest of *Prinia socialis* containing two eggs, which I recognised to be those of that bird. It struck me at the time that the little Cuckoo had made the discovery of the nest, and was meditating the substitution of her own egg. I suspect, therefore, that the rufous specimens are young, and that the female does not differ so materially from her mate. Besides the usual plaintive note; this species has also a cry almost exactly like that of the *C. fugax*, though of course much subdued and repeated faster. It is certainly the *C. flavus* apud Lesson (*Traité*), said to be from Bengal."—*Ibid.*

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* A young specimen of apparently this bird from Macao is very much deeper-coloured than usual, and may possibly be of a different species.

C. flavus. In the *Zoologie du Voyage de M. Bélanger*, M. Lesson confounds, I am much inclined to suspect, at least three species under this name; viz. the Indian *niger*, the Malayan *flavus*, and the Australian *cineraceus* (figured by Messrs. Jardine and Selby, *Ill. Orn.*, *pl.* LXVII), stating that it appears to inhabit all the isles of Sunda, Bengal, the Phillipines, Port Jackson, and Van-Diemen's Land. "A veritable Proteus," he remarks, "this little Cuckoo seems indifferently to assume several phases of plumage, according to what island of the Indian Ocean it inhabits; at least unless a plurality of species be confounded under the same name, which differ from each other only by very indistinct and uncharacteristic shades of diversity. Buffon, or rather Daubenton, has figured by the name of *le Petit Coucou de l'Isle de Panay*, *Enluminure* 814, one type corresponding to the bird which M. Bélanger has brought from Java, where it had previously been met with by MM. Labillardiére and Leschenault. *Sir Raffles* mentions it in his catalogue as occurring in Pulo Penang, and Dr. Horsfield informs us that it is the *Gedasse* of the Javanese.". This Malayan bird (which alone I apprehend to be the true *flavus*) is described as follows:—

"*Le Coucou à tête grise*, de Java, here described, is seven inches and a half (French) long. Its bill is blackish; the tarsi yellow. The head, cheeks, throat, and sides of the neck, are frosty-grey *(gris glacé)*; a lustrous and silky bronze-brown, with tolerably bright *(doux)* reflections, prevails on the back and wings, a dark ashy tint on the croup, and russet on the quills. All the lower-parts of the body are russet (or ferruginous, *roux*), or tolerably vivid blonde. The middle tail-feathers are uniformly bronzed brown above; the lateral ones are brown marked *(frangées)* with white: underneath all of them are brown rayed with white, purer and more distinctly on the margins. A similar individual exists in the Paris museum, brought, according to Leseur, from the Straits of Entrecasteaux."

Others from the various localities before cited "offer, upon examination, altogether the same characters, though we are compelled to recognise varieties of race, both according to size and the disposition of the colours of the plumage."

The Australian race (*C. cineraceus*, Vigors and Horsfield, *Lin. Trans.* XV, 298; *Barred-tailed Cuckoo* of Latham, *Gen. Hist.* III, 310;), if the figure of it in Messrs. Jardine and Selby's Illustrations of Ornithology (pl. LXVII) be correctly coloured, would seem to have the under-parts much deeper rufous than I have ever seen in Indian specimens, and the tail-feathers more broadly and conspicuously margined laterally with white. The following description is attached: — "The length of most specimens seems to be from nine to eleven inches. The upper-part of the plumage is a dull bluish-grey, on the wings tinged with brown, upon the tail nearly black; the throat is pale blue-grey, the rest of the under-parts reddish ochre-yellow, palest on the belly and vent; the inner webs of the quills are marked with white, which forms a diagonal bar across the under surface; the tail, with the exception of the centre-feathers, is deeply dentated with narrow white markings, which gives it nearly a barred appearance when expanded. The feet and legs appear to have been yellow. The females are generally duller in their colourings, and have the under-parts transversely barred with dull bluish-black. The young of the first year are dull umbre brown, with transverse darker markings."

The Indian bird appears to be typically dark grey without any rufous, at least the old male, and according to Mr. Jerdon's observation cited, some perhaps of the old females; but the ordinary dress of the adult female is, I suspect, as I have described it, namely, a garb corresponding to that so generally assumed by *C. poliocephalus* (*Himalayanus* of Vigors and Gould), and constituting the *hepaticus* variety of *C. canorus*: upon the first moult, the males appear generally to have the lower parts from the breast rufous, but rarely the upper part of the breast and fore-neck (as in the figure cited of the Australian *C. cineraceus*), indeed I have only seen one specimen thus characterized, and in this the colours of the entire under-parts are unusually dull and have some faint cross-striæ, indicative probably of a weakly individual. These states of plumage, together with the first or nestling dress, I have before minutely described.

It should be remarked, that I have seen no Indian specimen corresponding to the original description of *C. flavus* by Sonnerat and Daubenton, which would seem to have been unusually pale, having the "upper part of the head and throat light grey; the nape, back, and wings, pale umbre-brown; and the belly, thighs, and lower tail-coverts, pale yellow tinged with russet." The *C. rufivittatus*, Drapiez, may be presumed to refer to *C. flavus* in one or rather two of its phases; and his *C. pyrogaster* to one of these three species, if they be different. The latter point can only be decided by actual comparison of a number of specimens of each of them, and which way the probability lies cannot be suggested, as the Malayan *C. lugubris* is certainly distinct from the Indian *C. dicruroides*, though most closely allied to it, while *C. (Eudynamys) orientalis* spreads from India and China* through the countries of the Indian Ocean into Australia,—*C. (Chrysococcyx) lucidus* is common to the two latter regions,—various other species to India and the Malay countries, and others again to India and Africa. *C. canorus* extends over Europe, Asia, and Africa, spreading southward (according to Dr. Horsfield) into Java, where however it would appear to be rare, and it is not quite clear that *C. micropterus* has not there been mistaken for it: certainly, however, I believe, (so far as has been yet observed,) its distribution does not reach into Australia.

The present group of small Cuckoos with naked tarsi, and further characterized by a particular type of colouring in all its varieties, appears to me to be fully as much entitled to subgeneric distinction, if not more so, than those of the Metalline Cuckoo *(Chrysococcyx)* and the Drongo Cuckoos *(Pseudornis*, Hodgson); and I suspect that *C. honoratus* should be referred to it. M. Lesson assigns the *C. flavus* to his *Surniculus*, which he founds upon *C. lugubris*†; thus mingling two very distinct subgenera, which must be acknowledged separately if either be systematically distinguished from the other subgenera of restricted *Cuculus:* and if he had not so expressly selected *C. lugubris* as the type of his *Surniculus,* it would have been convenient to have reserved this name for the present form, retaining Mr. Hodgson's *Pseudornis* for the Drongo Cuckoos; but such an arrangement would not be sanctioned by Zoologists, and it remains, therefore, to propose a distinctive appellation for the subgenus under consideration, which accordingly may be termed *Polyphasia,* allusive to the numerous variations of plumage assumed by the species.

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* The Society has just received specimens of both sexes from Macao.

† In Mr. G. R. Gray's List of the Genera of Birds, 1st edit. p. 57, *Surniculus* of Lesson is put as a synonym of *Eudynamys;* but erroneously, according to M. Lesson in the work here cited, where he remarks—"Le Coucoul lugubre est pour nous le type d'un petit sous-genre qui semble confiné dans les îles de l'Est," &c.—*Zoologie du Voyage de M. Bélanger*, p. 236.

Subgenus *Surniculus,* Lesson, 1834; *Pseudornis,* Hodgson: the DRONGO CUCKOOS. According to Mr. Hodgson, the sexes of *C. dicruroides* are similar; and such I believe also to be the case with those of *C. lugubris,* and that the Javanese specimen described by M. Lesson as the female of the latter must therefore be the young. "Length nine inches (French), of which the tail occupies five inches: bill black, and tarsi brown. The feathers around the beak tinged with rufous; those of the upper-parts are brown, with a steel-blue reflection deeper on the wings and tail; a number of small and round white specks, encircled with black, are sprinkled over the head, shoulders, and wings; all the under-parts of the body are brown, tinged with rufous on the fore-part of the neck, and sprinkled with small whitish round spots; the posterior tibial feathers incline to be whitish; wings brown, varied with white internally about the shoulder, and elsewhere on their under-surface they are brown, having a white ray; tail brown underneath, barred with whitish on its small feathers only."

Since the publication of my Monograph of Eastern *Cuculidæ,* I have received a second Singapore specimen of *C. lugubris,* which resembles that which I formerly described in its dimensions, and is merely somewhat brighter black, with no white specks whatever on its upper surface, and very few (and those but faint and confined to the abdomen) below; the exterior short pair of tail feathers are rather longer. It is not improbably a male, while the other may be presumed to be a female; and it may be added, that the conspicuous white occipital spot of the other specimen does not occur. The same difference is observable in two very fine specimens of *C. dicruroides* with which I have also been kindly favoured; and it is remarkable that these have the tail no more furcate than in *C. lugubris,* while their dimensions correspond with those of Mr. Hodgson's Nepâlese examples. The length of the wing affords a ready distinction between these two closely allied species, being in both specimens of *lugubris* but four inches and three-quarters, while in six specimens of *dicruroides* before me it averages five inches and a half (a mere trifle more or less).

Subgenus *Chrysococcyx.* There is a *Iampromorpha amethystna* described by Vigor sin *P. Z. S.* 1831, p. 98, from Manilla; but it does not appear in what it differs from *Chr. xanclorhynchos.*

Eudynamys orientalis: the COËL. I am indebted to Mr. Frith for an egg of this species, found in the nest of *Corvus macrorhynchos*, together with one egg of that species. As the egg of *Cuculus canorus* bears a general resemblance in colour to those of the small ground-building birds in the nests of which it is most frequently deposited, so does the Coël's egg bear a marvellous resemblance to that of the Crow, being, however, much smaller. The specimen measures an inch and a half in lengh, and its colour is slightly bluish olive-green, rather pale than otherwise, with numerous reddish-brown spots (much as in some Blackbirds' eggs), and an indistinct zone of these near the large end. Mr. Frith has never found more than one Coël's egg in a nest, and has only met with it in those of the two Indian Crows. He has repeatedly seen the common Crow (*Corvus splendens*) attack and drive off the female Coël from its neighbourhood, and in one instance observed the latter, while trying to escape the pursuit, dash itself against a pane of glass in an out-house with so much force as to fall dead from the injury it received, the bill and fore-part of the head being quite smashed. I may add that the young nestling Coël, more especially the male, bears no small resemblance to a young Crow, *i. e.* a black one.

Oxylophus Coromandus: RED-WINGED CRESTED CUCKOO. Mr. Jerdon has seen specimens of this bird from the forests of Malabar.

O. edolius: PIED CRESTED CUCKOO. Of this species, the same naturalist has "obtained one young bird in the nest of *Malacocercus griseus*, in a thick hedge in Coimbatoor. It has a loud peculiar call, which it only appears to utter when on the wing. In Telegoo it is called *Gollee kokeelah*, or 'Milkman Cuckoo,' it being said to call '*Gollee Gollee*,' and when pronounced gutturally, these words have not at all a distant resemblance to its cry." Dr. Buchanan Hamilton also obtained the egg of this species in the nest of a *Malacocercus*, and figures it of a spotless blue colour, as is also the egg of its dupe; and he states that this bird only visits Bengal during the rainy season, in which he appears to be correct.

Genus *Rhinortha*, Vigors; *Anadænus*, Swainson; also *Bubutus*, Lesson. In the Zoology of M. Bélanger's *Voyage*, M. Lesson has figured the *Rh. rufescens* of my monograph as *B. Isidori*, whilst his *descripion* of the latter refers to *Rh. chlorophæa (Cuculus chlorophæus*, Raffles, &c.); and by the name *B. Duvaucelii*, citing his *Ornithologie*, p. 143, (or *Cuculus Sumatrensis* of the Paris Museum, not *C. Sumatranus*, Raffles,) he has given a description which probably refers to my *rufescens*, though I cannot understand what is meant by the italicised portion of the following quotation, which alone does not apply — "Cet Oiseau, de la taille du Coucou Edolio, a le bec jaune, la tête d'un cendré blanchâtre, *le plumage gris cendré*, les ailles rousses, l'abdomen et la region anale d'un rouge ochreux," &c. If it be intended that *the back* is coloured ash-grey, then probably M. Lesson's species is distinct. But it must be remembered that his description and plate of *B. Isidori* refer to different species, as before mentioned.

The *Phœnicophæus longicaudatus* of my monograph is M. Lesson's *Melias tristis*, and may rank therefore as *Ph. tristis*, unless it be considered worth while to separate the small-billed species from the others: and my *Ph. tristis* appears to be M. Lesson's *M. Diardi*, of which he states that it resembles the former species in its form and colouring, but is only halt the size, and presents some other differences; this bird is the *Cuculus Sumatranus* of Raffles, and must rank, I therefore presume, as *Ph. Sumatranus*. I am assured by Mr. Frith that this latter species occurs in the Soonderbuns of Bengal, and that the other is common on the hill ranges of Assam.

Ph. Jerdoni is "termed in Hindustani *Kuppra Popya*, and in Teloogoo *Wamaneh okee.*"—Jerdon.

Zanclostomus Sirkee is "called *Jungle Parrot*, both in Hindustani and Teloogoo, from its red bill."—*Ibid.*

Centropus Phillipensis "builds a very large nest in some thick bush or hedge, and lays two or three greenish-blue eggs. This I have on the authority of an excellent *Shikaree.* It occasionally pilfers eggs from the nests of other birds." — *Ibid.* When running up the bough of a tree, which it does with remarkable celerity, it often throws the tail up over the back.

C. Sinensis : Polophilus Sinensis, Shaw's *Zoology*, IX, 51. In my Monograph I referred this, with a note of doubt, to *C. Phillipensis*, but have since received the species from Chinghai, and it is closely allied to *C. lepidus*, but as large as *C. Phillipensis*, being very obviously distinct from both. Length about nineteen inches, of which the tail measures eleven inches, its outermost feathers four inches and a half less; wing seven inches and a half; and beak, which is much curved and robust, an inch and five-eighths to gape. Colouring much as in *C. lepidus*, but the head, neck, interscapularies, and under-parts, are considerably darker: the nape and interscapularies are dusky with whitish shafts, terminating in yellowish-white rigid and almost prickly tips; head browner, with shining dark shafts to the frontal plumes: the under-parts dingy-whitish, with dusky cross-bars on each feather, and also rigid yellowish-white tips, more particularly to the feathers of the throat and breast: scapularies dingy rufous; the wings brighter rufous, with nearly obsolete dark bars on their smaller coverts; the greater coverts, with the primaries, secondaries, and tertiaries, being in course of renewal, and those newly put forth are spotless rufous, whilst the unshed are barred with dusky: rump blackish; the tail and its upper coverts the same, barred with numerous whitish cross-rays: beak dusky-black, whitish along the edges of the mandibles and towards the tip of the under one; feet also blackish; and irides stated to be light horn, or coloured like the wings, though in the fully mature birds I presume they would be crimson.

" C. *Bengalensis* of my Supplement may be C. *lepidus*."—Jerdon.

Proceedings of the Asiatic Society.

(Friday Evening, 30th March, 1843.)

The usual monthly Meeting was held on Friday evening the 3rd March 1843, the Hon'ble Sir J. P. GRANT, V. P. in the Chair.

Read the following memorandum circulated to the Committee of Papers by the Acting Secretary, with the usual reference respecting the proposed admission of Professor JULES MOHL of Paris, as an Honorary Member.

"This honour is solicited for Professor MOHL, by our associate and most zealous Agent at Paris, Major TROYER.

The Professor is well known as one of the most distinguished Oriental Scholars in Europe, and as Secretary to the Societé Asiatique de Paris. He has also been for years a steady correspondent and a liberal contributor to our Library, and the warm friend of every Oriental Scholar visiting Paris; as well as, with Major TROYER, an active friend to our interests whenever they could serve them."

H. PIDDINGTON,
Acting Secretary Asiatic Society.

The report of the Committee being unanimously in favour of Professor Mohl's nomination, he was therefore duly elected.

Dr. TRANTER, Nizam's Contingent, was also duly elected, and the usual communications were ordered to be made to these gentlemen. The following gentlemen were proposed as Members:—

The Hon'ble Sir LAWRENCE PEEL, Chief Justice of Bengal, and W. SETON KARR, Esq. B. C. S. both proposed by Sir J. P. GRANT, and seconded by Sir H. SETON.

Read, extract from the Proceedings of February, announcing the intention of the Hon'ble H. T. PRINSEP, to vacate the Chair of the Society in consequence of his departure for Europe.

Read the following letter from him, addressed to the Acting Secretary.

H. PIDDINGTON, ESQ.

Offg. Secretary Asiatic Society.

SIR,—As the period is now just approaching for my departure from India, I think it necessary to place in your hands my resignation of the office of President of the Asiatic Society, and to request that you will lay it before the Committee of Papers, to be by them communicated to the General Meeting of next month.

I have the honor to be, Sir,
Your very obedient humble servant,
Calcutta, Friday, 18*th February,* 1813. H. T. PRINSEP.

Read the following Minutes of a Special Meeting of the Committee of Papers, held at the Society's Rooms, on Thursday, 23rd February.

Thursday, 23d February, 1843.

At a Special Meeting of the Committee of Papers,

PRESENT.

The Honorable Sir H. SETON,
Lieut. Colonel FORBES,
CHARLES HUFFNAGLE, Esq., and
The Acting Secretary,

Read the letter of the Honorable H. T. PRINSEP, resigning the chair of the Society.

1. Resolved.—That it be recommended to the Society, that a letter be addressed to the Honorable H. T. PRINSEP, expressing the deep regret of its members for the loss of his valuable aid, and their hope, that he would continue to forward the interests of the Society in Europe.

2. That it be farther recommended to the Society to request that its late President do oblige us by sitting for his Portrait (of Kit-Cat size,) and that a subscription be opened to defray the expence.

3. That it be farther recommended to the Society to request, that the Right Honorable W. W. BIRD, will be pleased to accept the President's chair.

The Honorable W. W. BIRD was unanimously elected President of the Society.

Read the following draft of a letter to be addressed to the Honourable H. T. PRINSEP:—

HONOURABLE SIR,—The Asiatic Society of Bengal has learnt with deep regret your resignation of its chair; a loss to its interests and to those of Oriental science and literature which it feels will not be easily repaired.

For its members fail not to recollect, Sir, at such a time, with how much zeal and perseverance, and for how many years, and even when pressed with the weight of official duties of the highest responsibility, you have devoted yourself, with untiring energy, to the pursuits of the scholar, the patient researches of the antiquary, and the minute and laborious investigations of the geographer and the historian, and what the fruits of these constant labours have been. Nor can they omit to mention, Sir, that you have ever been found the strenuous and able advocate of oriental literature, the generous and worthy associate and emulator of many of the great men whose labours adorn its annals and the records of their Society, and the kind and discerning patron of the humblest labourer in these and in many other fields: adding thus a lustre to the honoured name which you bear, and leaving to their Society the grateful duty of again enrolling that name amongst those of which it is so truly and so justly proud.

Deeply then, Sir, must the Asiatic Society regret the loss of one who has so much contributed to its advancement and to its reputation; but this regret is tempered by the confident hope which it now ventures to express, that, as the field which awaits you in Europe is not less a great, a noble, and an eminently useful one, you will still continue the same steady friend to the interests of Indian literature and science, which you have heretofore been.

Anxious, Sir, to possess some memorial of you, they now request that you will be pleased on your arrival to sit for your Portrait, which they are desirous of placing by the side of those of your predecessors in the Presidentship of the Society.

In conclusion. They beg to assure you, Sir, of their unfeigned respect, and to offer to you their best wishes for your future health and prosperity.

By order of the Society,

Asiatic Society's Rooms, 4th February, 1843. (Signed) H. PIDDINGTON,
Acting Secretary Asiatic Society.

It was ordered—That the letter be signed by the Acting Secretary on the part of the Society, as had been done in former cases, (Presidents Colebrooke and Harington,) and agreed upon, that a deputation consisting of the Committee of Papers, and of such members as might please to attend, should meet at the Rooms, at ten o'clock the following morning, for the purpose of waiting on the Honourable Mr. Prinsep with the letter, and from thence proceed to Government House, to notify to the Honourable Mr. Bird, his election as President.

The following list of Books presented and purchased was read :—

LIBRARY.

Books received for the Meeting of the Asiatic Society, on the 3rd March, 1843.

The Calcutta Christian Observer, March, 1843, new series, vol. iv. No. 39.—Presented by the Editor.

Journal of the Bombay Branch of the Royal Asiatic Society, No. 4, April, 1842.

Journal des Savans. Paris, Aout, 1842.

Journal Asiatique, 3me serie. Paris. Avril, Mai, Juin, 1842, Nos. 73, 74, and 75, tome xiii.—Presented by the Society.

Proceedings of the American Philosophical Society, 1841-42, vol. ii, Nos. 18 to 22.

Transactions of the American Philosophical Society, new series. Philadelphia, 1841, vol. vii, part i.—Presented by the Society.

The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science, 3rd series. London, September, 1842, vol. xxi, No. 137.

Report of a Committee of the British Association for the advancement of Science, pamphlet.—Presented by the Society.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for the month of January, 1843.—From the Surveyor General's Office.

Fonceux, Discours prononcé a l'ouverture du cours de Langue et de Literature Tibetaine, prés la Bibliotheque Royale. Paris, 1842, pamphlet.—Presented by the Author.

Fonceux, (Le sage et le fou.) Extrait du Kan — Jour. Paris, 1842. pamphlet.—Presented by the Editor.

Julien, Exerciées pratiques d'Analyse de Syntaxe et de Lexicographie Chinoise. Paris, 1842, 8vo.

Darwin's Journal of Researches into the Geology and Natural History of the various countries visited by H. M. S. *Beagle*. London, 1839, 8vo.—Purchased.

Offrande au Dieu de L'Univers, par A. Fabius. Lyon, 1842, pamphlet.

The Oriental Christian Spectator, 2nd series. Bombay, August, 1842, vol. iii, No. 8.—Presented by the Editor.

Royle on the Production of Isinglass along the Coasts of India, with a Notice of its Fisheries. London, 1842, pamphlets, two copies. Presented by the Author.

The Acting Secretary informed the Meeting, that the sum of Rs. 76 : 10 : 3 having been paid as import duty on Professor Mill's Bust, (to clear it from the Custom House pending the application) he had applied to the Collector of Customs for a refund of this amount, which upon his favourable report to Government, was duly ordered and paid.

Read the following letter from the Officiating Secretary to Government of India, Military Department :—

No. 285.

To the Secretary to the Asiatic Society.

Military Department.

Sir,—I am directed to acknowledge the receipt of your letter of the 24th November last, and in reply to transmit to you, for the information of the Asiatic Society, a Copy of the Surveyor General's Despatch, No. 36, dated 13th August 1842, the original of which was recalled by an Office Memo. of the 5th December last.

2. The Surveyor General of India, with whom it may be expedient you should communicate on the subject of printing the Report upon the operations for measuring an Arc of the Meridian carried through the centre of the Peninsula to the Northern confines of Hindoostan, has received instructions to take the necessary steps to ensure the proper publication of the Report in the Researches of the Asiatic Society.

I am, Sir,
Your most obedient servant,
W. M. N. Sturt, *Major,*
Officiating Secretary to the Government of India, Military Department.

Council Chamber, 17*th February* 1843.

And from the Secretary to Government, General Department.

No. 21, of 1843.

From G. A. Bushby, Esq., *Officiating Secretary to the Government of India, to* H. Piddington, Esq., *Acting Secretary to the Asiatic Society, Fort William, the* 15*th February,* 1843.

Political Department

Sir,—In acknowledging the receipt of your letter dated 22nd ultimo, I am directed to inform you, that His Honor the President in Council will be glad to have from the Asiatic Society, a few lithographed copies of the Inscription received from Aden, for the use of the Hon'ble the Court of Directors.

I have the honor to be, Sir,
Your most obedient Servant,
G. A. Bushby,
Officiating Secretary to the Government of India.

Fort William, 15*th February,* 1843.

From Secretary to the Government India.

From Officiating Secretary to the Government of India, to [illegible] Piddington, Esq., *Acting Secretary Asiatic Society, dated Council Chamber, 17th February*, 1843.

Revenue Department.

Sir,—The Hon'ble the President in Council having reason to believe, that the attention of the Asiatic Society of Bengal has been directed to the subject of the Nurmah Cotton, I am desired by His Honor in Council to transmit to you, for the information of the Society, and for publication in its Journal, the accompanying copy of a dispatch, No. 4013, dated the 31st December last, from the Secretary to the Government, North-west Provinces, containing particulars on the subject.*

I have the honor to be, Sir,
Your most obedient Servant,
Fred. Jas. Halliday,
Officiating Secretary to the Government of India.

Read letter from the Secretary to the American Philosophical Society, acknowledging the receipt of the Journal of the Society, No. 22 to 29, new series.

Read the following extracts from a private letter from M. Eugene Burnouf, of Paris, to the address of the late Secretary, which as testifying the high degree of estimation in which the Society's Transactions and Journal are held at home, will be found of interest to its friends and supporters in India.

"Ce sera une chose bien honourable pour la Société dont vous etes le digne organe, d'ajóuter un volume nouveau aux nombreux et beauvolumes qu'élle à déjà publiés, les derniers, notamment, ont óté particulieres ment distingués entre tous, à cause de la richesse et de la nouveauté dex matieres qu'ils renferment. It est à regretter que votre Société ait perdu par la mort prématureé de M. Csoma de Coros le moyen de donner à l'Europe accés a la littérature Tibétaine qu'il connaissait si bien ; mais vous avez autour de vous un si grand nombre d'hommes éclairés, qu'il ne vous sera pas difficile de combler cette lacune en portant la lumiere sur d'autres points non moins intéressants. Votre Société est dans une admirable situation dont elle à déja sçu profiter glorieusement pour elle et utilement pour la science, et dont elle profitera certainement encore.

Je ne veux pas ter miner, Monsieur, sans vous remercier trés vivement de l'envoi que vous avez bien voulu me faire d'un certain nombre de numeros de votre Journal; ce présent extremement précieux pour moi m'a prouvé que votre Journal, se soutenait à la hauteur ou l'avait porté votre eminent predécesseur J. Prinsep. C'est une chose capitale que ce Journal, et tons ceux qui en Europe le connaissent sont d'avis qu'il mérite que l'on fasse pour conserver son existence tous les sacrifices qui seront necessaires."

The following articles were presented to the Society by Dr. Hutchinson, B. M. S. and were upon the table :—

1. A Tartar Bow, Arrows and Quiver.
2. A Tartar Cross Bow and Helmet.

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* This valuable Paper was handed over for publication in the Journal.

3. A 3-barrelled Pistol.
4 A Hat, worn by Malay Fishermen in the Straits.

And through S. G. T. Heatly, Esq., from W. Maling, Esq., Baugundee, the following:—

1. An Oil-Nut, known familiarly as the Nepaul walnut, the kernel strongly savouring of the walnut, and very oleaginous. These specimens were procured from the garden of Mr. Maling at Baugundee, where the tree flourishes luxuriantly. It was said to be originally brought there by Mr. Becher, formerly Salt Agent, and to be a Nepaulese plant.
2. A kind of lac obtained from the Gaub, supposed to contain a red dye of value.

Zoology of Nipal.

A Portfolio of 31 Specimen Drawings, being a few of the illustrations of this proposed splendid publication, for particulars of which see advertisement, and specimen drawing, was exhibited, and excited the highest interest by the beauty of the drawings, and their remarkable fidelity.

Report of the Curator Museum Economic Geology for the month of February.

Museum Economic Geology,

During the past month, we have received from Captain Goodwyn, Bengal Engineers a Model of a Terrace with a coating of half an inch of Asphaltum. The following letter accompanied it:—

No. 6504.

Mr. Piddington,
Curator to the Asiatic Museum.

Sir,—I am directed by the Military Board, to annex copy of a letter No. 943 of the 8th instant, from Captain Goodwyn, and also to enclose a note from that officer of the same date.

2nd. The specimen of the native Asphaltum Rock mentioned in the note, accompanies this communication.

3rd. You will observe, that Captain Goodwyn is desirous of receiving an acknowledgment from you of the receipt of the specimens herewith forwarded.

Fort William, Military Board Office, 14th February, 1843.

I have the honor to be, Sir,
Your obedient Servant,
H. DeBude,
Secretary, Military Board.

No. 943.

To Major H. DeBude,
Secretary, Military Board.

Sir,—I have the honor to forward a section of prepared terrace with Concrete (which in this country can be well made with Jamma and Hydraulic Cement,) and half an inch of Asphaltic Mastic. The section shews the different strata, and I have sent it to the Military Board as a specimen of the solidity and toughness of the material after remelting, for the purpose of being floated on to a terrace.

2nd. I have communicated with Capt. Tremenhere on the subject of the probability of discovering, in the Tenasserim provinces, a Geological bituminous formation, from which something valuable might be obtained, and I at the same time sent him specimens of the raw material; but am sorry to learn from him in reply, that there is not any formation approaching that to which the mineral belongs.

I am now about to direct my enquiries in Arracan, as Petroleum wells and Naptha springs occur on the Irawaddy, and thence extend to the Arracan district.

I have, &c.
(Signed) H. Goodwyn,
Executive Engineer, 1st Division.

Barrackpore, 8th February, 1843.

(True Copy,) H. DeBude,
Secretary, Military Board.

My dear DeBude,—I have already deposited in the Economic Geologic Museum, a specimen of the native Asphaltum Rock, so if the Board after examination of the accompanying are not desirous of keeping it in the Office, pray send it to Mr. Piddington with this note, that he may understand it is to be placed in juxta-position with the rock I gave him before.

I send also a specimen of the Mineral Tar, an exudation from the crevices of the rock, which will complete the whole history, as the powder of the rock mixed with the Tar forms the Mastic which is on the prepared section of flooring in the box.

If it goes to the Museum, I shall be glad of a line from Piddington.

Your's truly,
H. Goodwyn.

In a private reply to Captain Goodwyn, the proximity of the Petroleum wells of Cheduba, as detailed in Captain Halstead's report, was pointed out to him, and the probability, that if the Asphaltum itself was not found there, the residue of the Petroleum might furnish a mineral Pitch, which mixed with lime would make a good Asphaltum. Experiments will be made on this highly interesting subject.

From —— Duncan, Esq., we have received a highly curious contribution of a piece of the Porcelain Tower of Naukin.

Captain Newbold has sent us, at my request, a specimen of the best Cotton Soil from Kurnool. He is good enough to promise us a complete series of soils from that quarter, which will be a great addition to our Museum, The following are extracts from his letter:—

Camp Pialcoorty, Kurnool, February 13, 1843.

My dear Sir,—I have this day forwarded by banghy, a specimen of our first class cotton soil in Kurnool. Let me know whether it is enough, and whether I shall send specimens of the *various sorts* of cotton soil for the Society.

I have not yet been able to visit the first class Tobacco field yet, and I would rather defer sending specimens until personal examination of the field, lest any error should occur. The cotton soil now sent is from a field in the vicinity of which my tents are pitched.

I shall be very glad if you will favour me with an analysis at your early convenience.

A specimen of some of the cotton soil of the Ceded Districts, which I sent to the Royal Society is in the hands of Mr. Solly, who has promised an analysis, I believe, to one of the Societies at home; but it had not been published at the time of my hurried departure from England. Professor Royle placed it in Mr. Solly's hands.

I was very much struck with the resemblance which the Regur soil that covers the *plateaux* of the Deccan bears to specimens of the "*Chorai Zem*," which Mr. Murchison brought with him from Russia, and which covers the Steppes of that country in a precisely similar manner.

The similarity also struck Mr. Lonsdale, the late talented Secretary of the Geological Society, who was also present at the Meeting when Mr. Murchison read his paper on the Geology of Russia in the last year.

Believe me,
Your's very truly,
T. J. NEWBOLD.

Mineralogy and Geology.

We have here to announce the recovery of the Catalogue of Captain Pemberton's Bootan specimens, which it will be recollected from my reports, had been sent to us by General McLeod, but without any Catalogue; this I have at length succeeded by his assistance in tracing out. The following is an extract from his private letter:—

"*London*, 5, *Manchester Square*, *Christmas Day*, 1842.

MY DEAR PIDDINGTON,—I had the pleasure of writing to you on the 30th ultimo, and then promised that I should write again, after Mrs. Pemberton and I should have an opportunity of looking into poor Pemberton's Journals, and I am happy to say, that we then discovered what we hope may prove useful in enabling you to carry out your views, regarding the collection I sent you, although the information appears rather meagre.

"As Mrs. Pemberton was so much better acquainted with his hand-writing than I am, she undertook to copy out all that we could discover on the subject, and when we were doubtful of the words, from our ignorance of Geology, she has underlined them; but she believes she made out almost all correctly. At all events, I have no doubt you will be able to clear up what may have appeared doubtful to us. We could discover nothing further than No. 138, nor could we find any Geological notes separate from this list. Enclosed you have Mrs. Pemberton's copy of the list, and it will afford us much pleasure to hear that it proves in any degree useful."

We have thus restored this very valuable collection to our Museum, and I have the pleasure to add, that we have also a complete set of duplicates of it, which will be packed for dispatch to the Honorable the Court of Directors.

In the course of my correspondence on the subject of Storms, during the past month I received from Mr. Howe, Marine Assistant to the Commissioner at Akyab, the following curious account of an eruption of one of their little volcanoes:—

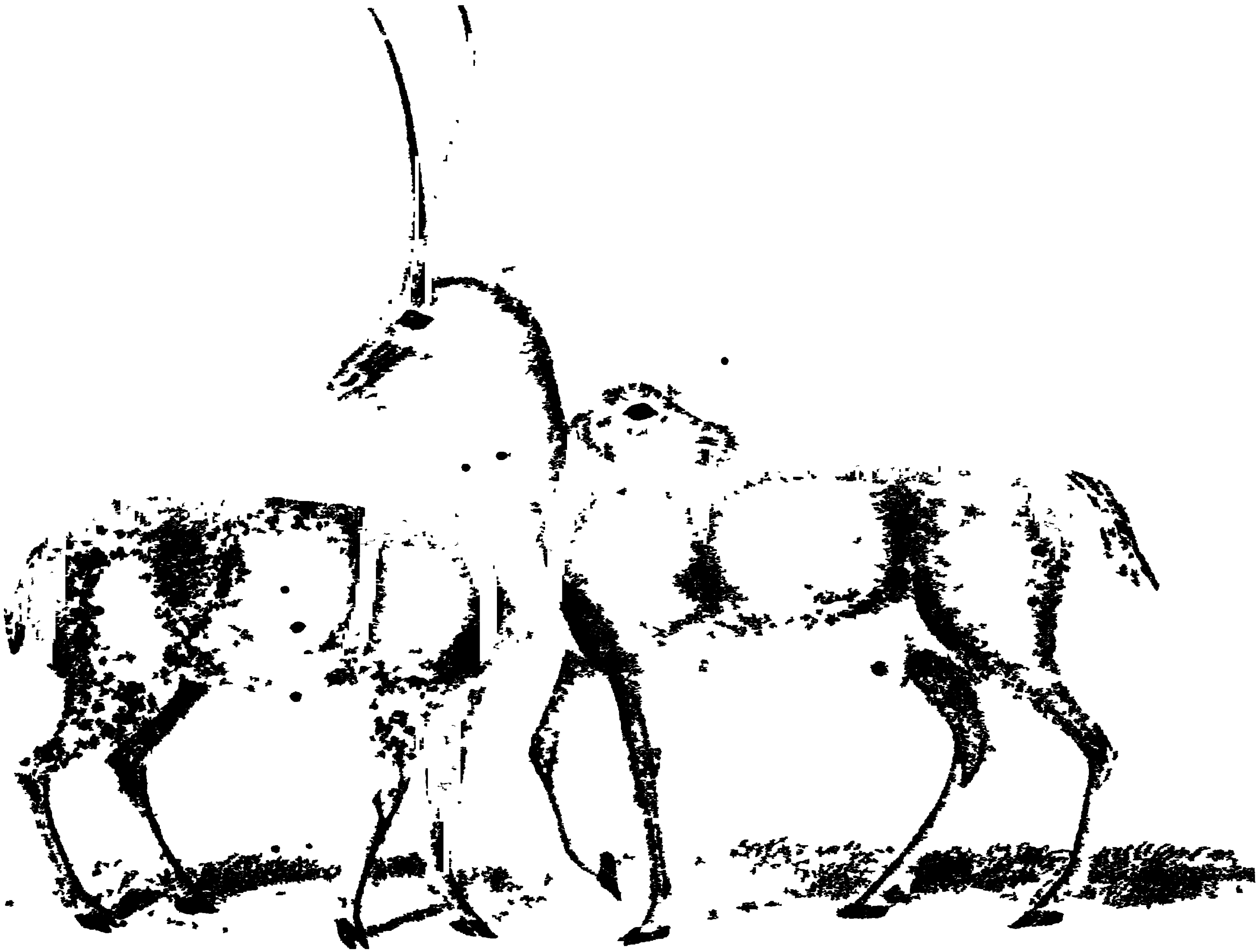
Khyouck Phyoo, Feb. 7, 1843.

"We, however, had last night a most magnificent volcanic eruption. The mountain, which is of moderate height, and shaped somewhat like a pyramid, is about 3 or 4 miles from the station which was rendered as light as noon-day, though midnight at the time. The eruption commenced at about 11, P. M., unaccompanied by any rumbling, but throwing up masses and particles of lava to an immense height, and presenting a most magnificent spectacle, visible all round the country. The weather had been for some evenings previous, close and threatening, though the glass kept up, varying from 30° 12′ to 29° 98′ for the last 5 or 6 days.

"The fire gradually went out, and all was still again by about half an hour after midnight.

"This eruption takes place, from what I hear, generally once in two years, sometimes annually."

We give with the present number, a specimen plate of the Chirú of Thibet, reduced from a folio-sized drawing, to accompany the Advertisement of the Illustrations of the Zoology of Nepal, to be published by Mr. Howard of London, which will be found at the end of the number; and it is but justice to the extraordinary native talent which has been thus developed amongst the Nipalese, by the means and patronage which have been so liberally afforded to them, by our talented associate to say, that judging from a port folio of the drawings lately exhibited at the Society's Meetings, nothing can surpass the truth and beauty of these Illustrations, which in the hands of Mr. Howard give every promise of being in the very highest degree worthy of the patronage of the Indian and European public.



JOURNAL

OF THE

ASIATIC SOCIETY.

Memoir on Indian Earthquakes. *By Lieut.* R. BAIRD SMITH, *Bengal Engineers.*

Among the various Committees established by the British Association for the investigation of subjects of general scientific interest, one has been appointed to register Earthquake shocks in Great Britain, and its labours have already been made public in several Reports to the parent body. From the discussions consequent on the presentation of these Reports, it appears, that in the opinion of well qualified judges, results of but little comparative importance can be anticipated from observation made in localities, where the disturbing forces act with such feeble intensity as in those brought under the notice of the Committee, and it is therefore considered desirable, that similar observations should be made abroad, in tracts of country where greater energy characterises the disturbing powers, and where the effects of these are exhibited on a larger and more important scale. Several such tracts are to be found in India, and a few of the most remarkable convulsions experienced throughout them, are already familiar to scientific men. But no systematic effort has yet been made to record and analyse the various phenomena of Indian Earthquakes, and the narratives of these are scattered throughout the pages of various works, without connection and without method. To collect from every available source, all the information connected with Earthquake shocks in India and its frontier countries, both in regard to those that have already occurred, and those that in future may occur, is the principal object proposed in this investigation. In regard to the historical portion of the subject, I cannot but feel conscious of its imperfections, since accounts of Indian Earthquakes are in general so meagre in important details, and must always be sought for under so many different sources, that to make the enquiry perfect, would require an amount of leisure and literary resources that very few, if indeed any, in this country, can command. In tracing the history of our Earthquakes, I have, however, done all I could with the materials at my disposal, and perhaps I may yet be able to complete what I now feel to be so imperfect.

More sanguine hopes of interesting results may, however, I think, be entertained in regard to Earthquakes that may be experienced after this time, since a general interest has been awakened in the subject, and the attention of many intelligent and well qualified observers attracted to it. Observations will moreover in future be centralised, and the unsatisfactory labour of gleaning information from many detached sources will be saved. Earthquakes are almost invariably observed when the feelings are excited, and emotions adverse to a calm, deliberate judgment on accompanying phenomena have sway. The greater the scale on which the disturbing forces are exhibited, the more intense will such feelings and emotions usually be, and in those very cases where minute and careful observations would be of the greatest value, observers are generally in a state the most unfavourable for making them. The sensible and permanent effects of Earthquake shocks are frequently detailed with painful minuteness, but those more temporary and evanescent, but at the same time, more immediately connected with the causes to which such convulsions are due, are allowed to pass by unobserved. The tendency to exaggerations induced by this state of mind requires constant allowances to be made for the statements of observers, and we shall be able to estimate the amount of this allowance, only after the phenomena of Earthquakes have been brought to the test of actual measurement by the use of appropriate recording instruments. Such instruments have been brought into use by the Committee of the British Association, but they are yet far from being perfect; and before their full utility can be felt, their sensibility must be increased considerably beyond the point to which it has yet been carried. This will no doubt ere long be accomplished, and the details of the phenomena of Earthquake shocks be removed from the ill-defined province of feeling, and brought under that of measured space and number.

The chief obstacle to the introduction of such recording instruments as are alluded to above, throughout the Earthquake tracts of India, will probably be found in the incessant fluctuations of society, and the consequent impossibility of obtaining consecutive series of observations. In reflecting on this point, it has appeared to me, that the most permanent local establishments in the country are the mission stations, and that if Missionaries residing in favourable localities, could be induced to receive and record observations with our instruments, they would confer a boon upon science at a very trifling sacrifice of time or labour in the cause. Earthquakes usually occur at distant intervals, and the observations required upon them, are neither complicated nor laborious. I would therefore hope to obtain in course of time the co-operation of those members of favourably situated mission establishments, who may not be unwilling to devote a limited portion of their time and talents to the elucidation of what is certainly one of the most interesting chapters of the physical history of India. Meanwhile, however, until arrangements can be matured for supplying instruments to those willing to receive them, I trust I shall continue to receive the interesting communications of those observers who have so zealously assisted me during the past year, and for whose aid I feel most grateful. Their individual labour will come more appropriately under notice in another page; but I am desirous of expressing to one and all, my acknowledgment of their valuable assistance, since to it must be traced all the interest that this investigation may possess.

To the gentlemen connected with the public press of India, especially to Messrs. Stocqueler and Place, Editors respectively of the *Calcutta Englishman* and *Delhi Gazette,* I am indebted for essential aid, and I trust I may continue to receive from them such notices of Earthquake shocks, as from time to time, may be made public in their papers.

My information relative to Earthquakes in the presidencies of Madras and Bombay is, I regret to say, extremely limited. In both there are tracts occasionally subject to such shocks, and I would solicit the co-operation of observers under whose notice they may come.*

This Memoir will be divided into the four following parts :—

I. Register of Indian Earthquakes for the year 1842.

II. Historical Summary of Indian Earthquakes, with some remarks on the general distribution of subterranean disturbing forces throughout India and its frontier countries.

III. Analysis of the phenomena of Indian Earthquakes, as exhibited in the two preceding parts.

IV. Remarks on the points to be observed during Earthquake shocks, and on the means of making the requisite observations.

Part. I.—Register of Indian Earthquakes, during the year 1842.

1. JELLALABAD EARTHQUAKE OF THE 19TH FEBRUARY, 1842.

My attention was first prominently attracted to the subject of Earthquakes in India, by the occurrence of that of the 19th of February last. A few brief and imperfect notes founded upon the details I was able to collect, were published in the Journal of the Asiatic Society and my object then was, more to direct attention to the subject of Earthquakes in general, than to furnish rigidly accurate conclusions on this case in particular. Such conclusions were indeed incompatible with the nature of the information furnished me, and I have subsequently ascertained, that many corrections of these are requisite. Yet the notes have fully answered their design, and have led to my procuring much information, which, had they not been published even with all their imperfections, would certainly have been lost to science. From the date of the Earthquake my register was commenced, and it is my intention to continue it regularly, publishing it at yearly intervals. I have some recollection of two Earthquakes having been experienced in Delhi during the month of January 1842, but unfortunately I did not record them at the time, my register not being then commenced, and I have been unable since to verify this impression. The Jellalabad Earthquake therefore comes first in order, in the year 1842.

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* All communications on the subject of Earthquakes in India may be addressed to the author at Seharunpore, North-western Provinces, Bengal, or if preferred, to the Secretary to the Asiatic Society, Calcutta, or to any of the public papers.

In tracing the progress of this Earthquake, I purpose commencing at its most westerly limit, and following it to the Eastward. According to this plan, the first place where its effects are to be noticed is *Cabool*, (lat. 34° 30′ 30″; long. 69° 7′ E.) The intelligence from Cabool is, however, extremely limited, being confined to the following short extract from a narrative of the events of the captivity at that city, by Dr. Berwick and his party of sick and wounded, left behind, when the British force attempted to retreat to Jellalabad.

"On the 19th of February," it is remarked, "they were visited by a most awful Earthquake. It continued for some minutes, and rocked the fort in a frightful manner. All the men able to move rushed out into the open air, every moment expecting the walls to fall in and bury them; but God was good, and after three minutes' duration, each shock succeeding the other in rapid succession, it ceased. The walls were dreadfully shaken, especially the side wall of the European ward, which came down a few days afterwards." From the effect of the shock, as detailed in this extract, it may safely be inferred, that Cabool did not form its extreme westerly limit, but we have no authentic intelligence of its progress beyond that place, and its would therefore be vain to speculate upon the point.

Proceeding Eastward over a tract of country more rugged and inhospitable than can well be conceived, and descending from a height of about 7,000 to a little more than 2,000 above the level of the sea, we enter the valley of Jellalabad, where the devastating effects of the Earthquake were exhibited on a larger scale than at any other place. The whole line of the Cabool river from Cabool to Jellalabad, experienced, however, the effects of the shock, and many of the forts of the chiefs were laid in ruins, or seriously injured. Among others, that of Budiabad, in which the English prisoners were then confined was, I am informed, much shaken, although not destroyed.

The valley of Jellalabad is thus briefly described by Lieut. Wood of the Indian Navy:—"A ridge of hills called Deh Koh, or the black mountain, rises about Jugdulluck and running East by North till it meets the Cabool river, bounds the plain of Jellalabad on the North; to the South it has the high hill of Nungsihar; East it has the hills of Alee

Baghan and desert of Buttee Kote; while its Western limit is marked by ridges, which here project into the valley of the Soorkh Rood. The length of the Jellalabad plain is 25 miles, and its width does not exceed four miles."

The town of Jellalabad (lat. 34° 25′; long. 70° 30′*) was garrisoned at the period of the Earthquake by General Sir Robert Sale's Brigade, and hence our information as to the effects of the shock is in considerable detail. The following extract from the *Englishman*, gives the most graphic account of the Earthquake I have yet seen.

Extract from a letter published in the Calcutta Englishman of the 16th May 1842, dated Jellalabad, 28th April, 1842.

"On the 19th February, we had one of the most awful Earthquakes I have ever experienced; it occurred at mid-day, being very stormy at the time, with clouds of dust floating through the atmosphere. The shock lasted about a minute and a half, and commenced with a sound like the rolling of a heavy waggon over a wooden bridge—the earth swung to and fro like the rocking of a cradle; not a man could keep his legs; every one fell prostrate, and a sensation of sickness and giddiness affected all. Bastions and houses came tumbling down with a dreadful crash, and we verily believed we were about to be swallowed up in some yawning chasm. The earth did open in several places, and water appeared on the surface of the ground. The river was thrown into the most violent commotion, and the water dashed over its bank with frightful violence. I was standing on a bastion at the time, it split in two places and crumbled down; I was precipitated to some distance, where I lay stunned and stupified with horror. No one could utter a word, and every face was blanched with terror and apprehension; here was death in a new form, for which we were totally unprepared. Providentially for us, not a man of our party was killed; many were injured by the falling of the houses, but none dangerously: a few of the inhabitants of the town were killed, where the fall of the high houses choked up the street, and left no room for escape; but on the whole the accidents were few, compared to the nature and extent of the mischief. From this period until the middle of March, we had frequent slight shocks, sometimes so many as six or seven during the twenty-four hours. Our fortifications were seriously damaged by this awful visitation, and we fully expected the enemy would have made a rush upon us, for there were gaps enough, but every precaution was taken to repel them. They hovered about us, however, like birds of prey, trying to ascertain the extent of our damage; whether they learnt it or not I cannot say, but seemingly they thought it better to let us alone. We fell to work again with renewed energy, and in a short time repaired much of the injury the works had sustained, labouring night and day without intermission, until we were once more able to set the enemy at defiance."

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* The positions of places in Affghanistan, are taken from Walker's New Map.

The appearance of water at the Earth's surface through fissures made by Earthquake shocks having been connected with theoretical considerations on the causes of the events,* I felt desirous of verifying the statement made in the above extract, that this phenomena was observed at Jellalabad, and I therefore wrote to my friend Major Broadfoot, C. B., requesting him to give me any information on the point he might possess. In reply, under date Jellalabad, 13th July 1842, he thus writes: "You ask where the water came from that issued from the cracks in the earth. I saw no water issue from the cracks which opened where I was, nor signs of any in others, and I saw more of the effects and sooner than perhaps any one else; nor do I remember hearing of water issuing from the earth at the time. Still it *may* have happened." And the nature of Major Broadfoot's duties gave him the best possible opportunities of observation, it is probable that had water actually been ejected from the earth, the circumstance would not have escaped his notice, and the statement that it did do so, must be considered as very doubtful.

A few further particulars of the Earthquake at Jellalabad are given in the following extract from Sir Robert Sale's official dispatch, dated Jellalabad, 16th April 1842: "But it pleased Providence, on the 19th of February, to remove in an instant this ground of confidence (alluding to the defensive works executed by Major Broadfoot for the protection of the city.) A tremendous Earthquake shook down all our parapets built up with so much labour, injured several of our bastions, demolished a third of the town, made a considerable breach in the rampart of a curtain in the Peshawur face, and reduced the Cabool gate to a shapeless mass of ruins. It savours of romance, but it is a sober fact, that the city was thrown into alarm, within the space of little more than one month by the repetition of full one hundred shocks of this terrific phenomenon of nature."

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* On Hydrostatic Pressure as a cause of Earthquakes, by the Rev. John Toplis, B. D. Jameson's Journal, No. 59, p. 84.

The Jellalabad Earthquake is here considered solely in its relations to science; but it may be permitted me to turn for a moment from the cold record of physical phenomena, and to express the admiration all must feel at the noble conduct of that gallant band, whose moral courage rose superior to the depressing influence of such a series of convulsions at such a crisis, and whose physical exertions so rapidly obliterated their devastating effects, that their wondering foes could attribute the result only to some supernatural agency, to some English witchcraft.

The superior intensity of the Earthquake in the immediate vicinity of Jellalabad, and the incessant state of "*tremblement*" into which the earth there was thrown for so long a period after the great shock, appear to me to render it almost certain, that the focus of disturbing force was situated in that valley, and that the undulations generated were propagated East and West from some point in it as a centre. Most of the shocks subsequent to the great one of the 19th February were local, and a very few only were felt at Peshawur to the Eastward, and none in so far as I know to the Westward. The disturbing force to which the series was due, must therefore have been confined in its action to the valley of Jellalabad, and the effects would indicate, that its focus was at no very great depth beneath the surface of the earth, and that farther, a large amount of its power was expended on the 19th, since the other shocks were feeble in comparison with the one experienced on that day.

From the best information I can procure, the time at which the Earthquake was felt at Jellalabad was 11h. 40m. A. M. All the times subsequently stated, will be reduced to Jellalabad time, so as to shew correctly the progress of the shock. This correction was neglected in my notes formerly published, in consequence of the very great discrepancies among the periods stated by different observers, and the impossibility of their knowing which were correct. Information subsequently obtained, has, however, admitted of greater certainty as to time, and greater care is therefore requisite in combining the observations.

From Jellalabad, the shock affecting a portion of the Suffeid Koh range of mountains, with the numerous subordinate ranges that diverge from it, reached the town of Peshawur, (lat. 34° 06′; long. 71° 42, E). From the circumstance of General Pollock's force having been encamped at Kawulsur, about eight miles from Peshawur, and the communication being uninterrupted, the details relative to the effects of the shock there, are fuller and more satisfactory than would otherwise have been the case.

The following extracts from letters published in the *Delhi Gazette*, give the most complete accounts of the effects of the Earthquake I have been able to find :—

Extract from a letter, dated Kawulsur, 20th February, 1842.

" Yesterday a fearful Earthquake visited this part of the world. The shock which came on————,* was long continued, and men, horses, tents, even the ground under us, and the hills in the distance, appeared to be moving. It was an awful visitation, and made every heart quake. In the direction of Peshawur, (eight miles distant,) clouds of dust appeared, which proved to have been caused by the falling of very many houses and buildings. A salute was fired from the battery at Jumrood, for the purpose of announcing the safety of Rajah Pertaub Sing, son of Maharajah Shere Sing, who is now at Peshawur, and of whom it is said he narrowly escaped death : the building in which he had been sitting came down almost immediately after he quitted it. The natives say a tenth of the city is down, and a number of the inhabitants killed."

Extract from a letter, dated Kawulsur, 19th February, 1843.

" It is now about 12 o'clock mid-day, and we have just experienced a most awful Earthquake in Camp. The natives say that nothing so severe of the kind has been experienced in India for the last fifty years. The earth literally trembled like an aspen leaf, and rocked to and fro as an infant's cradle, or like a ship at sea. Many of the camels that were carrying the baggage of the troops to Col. Wild's camp were thrown down, and so great was the shock, which lasted fully five minutes, that I was obliged to support myself by holding on to the camp furniture, and many of the officers fancied themselves suddenly taken ill. I expected every moment to have seen the earth open and swallow us up, and it is only by God's great and merciful providence that we have escaped through such an awful convulsion of nature.

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* The time stated being erroneous, is omitted. The times generally are still by no means so satisfactory as is desirable.

"Every one complains of nausea. We have just been observing immense volumes of dust, that completely darken the atmosphere in the direction of the old ricketty town of Peshawur, which is supposed to be nearly levelled with the ground, as the houses are but weakly built, being merely propped up by the beams of wood which may be observed placed in different spots under large walls and corners of the houses, and are even dangerous to passers-by at all times. I doubt not but to-morrow's dawn will bring us dreadful intelligence, and produce a fearful account of lives lost.—*20th February*. Reports say, that only from 40 to 50 persons at Peshawur were crushed and killed among ruins of the falling houses. General Avitabili's large dwelling house, which had recently been built, and was being finished, fell in, but luckily did no injury to any one in the house."

The period of the shock at Peshawur was 11h. 41m. 12s. Jellalabad time, the observed time at the former place being 11h. 46m. and the difference of longitude 4m. 48s.*

The course of the Earthquake hitherto has been through a tract of country rugged and mountainous in the extreme. The geology of the district extending from Cabool to Peshawur has never been satisfactorily described, and very little, I might indeed say nothing, whatever is yet known about it. Dr. Lord gives the following general remarks on the great features of the country, and some of the points alluded to by him, as indicating severe disruptive action, are interesting in connection with the frequent occurrence of Earthquake shocks throughout the tract. The facts embodied in Dr. Lord's remarks, must be separated from the theoretical views with which they are associated, the latter being open to serious objections; but as there is reason to believe they are now under discussion by a very competent authority, it is unnecessary to allude farther to them here.

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* Captain Lawrence, late Political Agent at Peshawur, assures me, he feels quite certain as to the period of the Earthquake at that place; he having been led to watch the time narrowly, in consequence of a meeting between General Pollock and Rajah Pertaub Sing being to take place at noon exactly, arrangements for which were in progress under his superintendence.

"A parallel of latitude," Dr. Lord remarks, "drawn through Kalabágh and west of the Indus would present a remarkable difference in the course of the mountain chains as observed to its north and south sides. In the latter direction, the Soliman and Kala ranges, the one of which may be looked upon as a continuation of the other, generally preserve an almost perfect parallelism with the course of the Indus; while on the other side every range, and they are numerous from the Himalaya and Hindu Kosh to the Salt range inclusive, are at right angles with the direction of the stream. In other words, the general line of the former is North and South, of the latter East and West. It is of the latter, and the country they include, that I would more particularly speak at present.

"In addition to the general course of the chains thus laid down, there is another fact, subordinate, yet of no less importance towards determining the physical formation of this part of the country. When the two mountain ranges have for some time preserved their parallel East and West course, the Northern is observed to deflect, or send off a branch towards the South, while a corresponding deflection or ramification of the Southern chain comes to meet it, and the plain which otherwise would have been one continued expanse from East to West, is thus cut into a number of valleys, the longitudinal axis of which, however, is still in general to be found in the same direction. If we conceive these valleys to be few, spacious, and well marked towards the North and South, while in the central or Cabul region they become small, numerous and crowded, so as to resemble a tangled maze or net-work, we shall have a just general conception of the tract of country west of the Indus, which may be familiarly described as lying between Cabul and Kalabágh.

"Unquestionable geological facts, such as the structure of igneous rocks poured out under strong pressure, the presence of fossil shells

&c. lead me to the belief that several, if not all of these valleys, were at some former time the receptacles of a series of inland lakes, and the natures of the shells found (principally planorbes and paludinæ) seem to indicate that the waters of these lakes had been fresh. In this manner three grand sheets of water, separated by the mountain deflections before alluded to, would appear to have occupied the entire country from Kabul to the Indus, and their basins may now be distinguished as the plains which afford sites to the three cities of Kabul, Jellalabad, and Peshawur.

"The draining of these basins is tranquilly carried on by the Kabul river, which runs along the northern edge of each, conveying their united waters to the Indus: but in former times when more energetic means were necessary, the mountain barriers burst, and the shattered fragments and rolled blocks that now strew the Kyber Pass, bear testimony to its once having afforded exit to a mighty rush of waters, while the Gidur-Gulla (or Jackall's neck,) a long defile east of the plains of Peshawur, clearly points out the further course of the torrent towards the bed of the Indus, whence its passage to the ocean was easy and natural."

The questions in pure geology involved in these remarks I do not concern myself with, but I have quoted them to shew, that indications of powerful disruptive forces prevail throughout the whole of the course of the Earthquake of the 19th February hitherto described, and this point is all that circumstances admit of being established. Of the nature of the rocks composing the mountain masses between Cabool and Jellalabad, I have seen no account. Major Broadfoot states, that the rocks in the immediate vicinity of Jellalabad are gniess, and Sir A. Burnes mentions, that mica slate and granite are also found there. Relative to the rocks in the Kyber Pass, my friend Lieut. Goodwyn of Engineers, writes thus: "The Kyber rocks are of flinty slate, varying in all degrees of hardness from flint to slate. Sometimes the rock is nearly one solid mass, the strata are so slightly defined, and they cannot be separated with a crow-bar—at other places, a blow of a pickaxe is sufficient to shiver it into fifty little cubes of slate; a considerable quantity of earth lying between the strata, which falls down in dust. Sir Alexander Burnes says, "The formation is a flinty slate overlying conglomerate, but

I have also frequently found the conglomerate overlying the slate, and they are frequently united in the same rock. The conglomerate is very hard, and we could not progress more than four inches an hour, with two-inch jumpers, in boring holes for blasting. The stones seem cemented with a sort of iron cement."

After leaving Peshawur, the shock traversing the alluvial plains of the Punjaub reached Ferozepore, (lat. 30° 56′ 50″; long. 74° 35′,) where its force was still felt to be severe, though no longer destructive. No accounts have been made public of the effects of the shock at any place intermediate between Peshawur and Ferozepore. The latter place was reached at 11h. 48m. 40s. A. M. Jellalabad time.

The city of Delhi, (lat. 28° 40′; long. 77° 16′,) is the next place from which we have authentic intelligence of the effects of the Earthquake. The intensity of the shock was, however, very much diminished here, and beyond the motion of the ground no other effects are alluded to. The period of the Earthquake at Delhi, as stated in my notes formerly published, I find to be erroneous, and the proper time from the best information I have been able to procure, is 11h. 53m. 56s. A. M. Jellalabad time. Relative to the nature of the shock at Delhi, Mr. Sub-Conductor Bingham of the Sappers and Miners thus writes: "The total duration of the shock, which appeared to me to consist of several distinct undulations of the earth, but without perceptible intervals between them, could not have been less than five or six minutes. But of this I cannot speak definitely, as I had no reference to a time-piece during the shock."

About twenty miles to the South-west of the city of Delhi, at a village called Sonub, is situated a hot spring, of which the following description is given anonymously in the second volume of the *Gleanings in Science*, p. 34:—

"At Sonub near Delhi, there is a hot spring (sulphureous) which attracts from the surrounding country myriads of people for the purpose of bathing; the bath is constantly filled with as many people as it can hold, (except perhaps for a few hours during the night,) in the day time by men, and the night time by women; most of the inhabitants of the town itself are in the habit of bathing in it daily, and it is perhaps to this habit, that they are indebted for the cadaverous and unhealthy appearance so common among them. The temperature of the spring in January last, (1829,) was 103°; but it varies, for in July, 1826, I observed it as high as 110°. The flow of water also varies considerably."

Dr. Malcomson of Bombay, having made enquiries of Dr. Falconer, late Superintendent of the Botanic Garden, Seharanpore, as to whether this spring was affected by the Earthquake of the 19th February, the latter referred the question to me, and I availed myself of the assistance of my intelligent and indefatigable correspondent, Mr. Bingham, in instituting enquiries on the spot. Mr. Bingham applied first to the Deputy Collector of the district of Goorgaon, in which district the spring is situated, but so little interest was taken by him in the matter, that he did not even reply to Mr. Bingham's letter. This indifference, on the part of the Deputy Collector, was, however, compensated for by the interest and activity, shewn by Mr. H. Martin, the Superintendent of Roads in the same district, who so soon as applied to by Mr. Bingham, visited the spring, and addressed the following interesting letter to me, giving the results of his enquiries:—

Letter from Mr. H. Martin to my address, dated 15th October, 1842.

Sir,—Having been requested by Mr. Bingham, to obtain for you what information I could on the subject of the alterations which took place in the hot wells of Sonub. I yesterday visited them, and have much pleasure in transmitting to you the results of my enquiries, which I trust will prove of utility to the object you have in view.

"On the 19th February last, (the day of the Earthquake,) the water in the wells became as cold as that of the ordinary wells of this country —the issue of the spring was observed to flow much slower, and in less quantities than formerly, and at times the spring would be completely dry. No disturbance of any kind was visible, nor any other change than what I have noticed. The above appearances continued for twenty-five days, when the wells resumed their former state.

"I would remark, that this statement may be credited, as all to whom I applied answered with readiness, and from the length of time which the appearances lasted, there could hardly be a mistake.

"Should you wish for any more detailed particulars, or if I could be of any assistance to you in any way on any other subject that may relate to this district, I shall be most happy in furnishing you with all the information I can procure." I am, &c. &c.

H. MARTIN.

In continuation on the same subject, Mr. Bingham writes under date 1st Nov. 1842:—

"I wrote some time ago to Mr. Martin, for information regarding the locality of the springs, and it appears from his reply, that they are situated within 200 yards, (but he does not state whether on the East or West side,) of a range of low hills, which I have myself formerly traced from where they cross the Jumna, about two miles to the north of Delhi, running in a southerly direction beyond Muttra.* There are no rocks in the immediate neighbourhood of the hot springs, but the hills are principally composed of a very hard stratified quartz stone, the strata dipping at an angle of 70° or 75°, with numerous vertical cracks and fissures through them, as if they had been suddenly and violently heaved up.

"There is also here and there a stone of different formation found lying upon the quartz; in some places, it is merely '*bujree*' (red sand,) in others a soft red sandstone. The city of Delhi is mostly built upon these rocks, and some years ago when employed in blasting to form a ditch for one of the bastions on the south side of the city, I had often occasion to remark the impressions of the roots and fibres of vegetables† in the same stone; but in the quartz rock, I never met with any foreign substances, except some slight traces of a metallic nature, which appeared to me to be zinc or copper."

As the Sonub hot spring in all probability rises through one of those fissures so common in the vicinity, the effect of the earthquake seems to have been to close this exit of the waters temporarily, as the supply diminished so much immediately afterwards. And the diminution of the supply would lead to the water becoming colder in consequence of its exposing a lesser bulk to the cooling influences of the strata through which it passed. The obstacle in the path of the waters, whatever its nature may have been, appears to have been wholly removed at the end of twenty-five days, as then the temperature and quantity of the water returned to its usual standard.

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* These are the Aravulli range of hills, which abutting on the Western termination of the Vindyas, run up through Rajpootana, and are lost at some little distance to the Northward of Delhi.

† The nature and relations of this sandstone render it probable, that these vegetable forms were not the remains of actual vegetables, but were those dendritic forms of doubtful origin so common in similar circumstances.

Continuing to the Eastward of Delhi, the next place from which intelligence was received relative to the effects of the shock, was Poojnah, a station on the Doab Canal, (lat. 29° 32′, long. 77° 27′ ?) where Sergeant and Assistant Overseer Renny observed and communicated to me the following detail:—

Extract of a letter from Sergt. Renny, dated Poojnah, 19*th Feb.* 1842.

"I also beg leave to inform you, that we felt a very severe shock of an Earthquake here at — *. It lasted about three minutes with intervals. My whole family felt it as well as the people about my place, who came running to me much alarmed. It was first noticed I believe by myself, as I was then sitting writing, and found a heavy table on which my desk was laid, much agitated, which I thought was caused by some one moving; but I soon found my chair in motion also, and on looking about, I perceived every thing moveable in the room in a state of agitation. A few hours before this, I observed the water in the canal was unusually muddy, and after the shock was over, I went to look and found it much disturbed by a high swell, whether occasioned by the shock or not, I cannot say."

Sergt. Renny is entitled to my best thanks for these interesting details. The unusual muddiness of the canal could not possibly have been due to the influence of the Earthquake, since the direction in which the shock travelled was against, not coincident with that of the current in the canal, hence the disturbance of the silt in the bed of the canal could not *precede* the shock; but it is quite possible, that the high swell observed *after the shock had passed*, may have been occasioned by it. The time of the shock at Poojnah was, as nearly as I can estimate it, 0h. 00m. 12s. P. M. Jellalabad time.

From Poojnah, the shock travelled to Saharanpore, where it was just felt, but attracted no particular attention. It was next experienced at Kulsea, another station on the Doab Canal, about twelve or fourteen miles to the Northward of Saharanpore, where its effects were very perceptible. The motion here, as described to me by Mr. Sub-Conductor Pigott, was of the same undulating character as observed throughout, but its duration was certainly not greater than one minute. Immediately on perceiving the shock, Mr. Pigott examined the sun-dial, and making a slight allowance for the error of the dial, and that for the longitude of the spot which has not been determined, the true period appears to have been very nearly 0h. 03m. 44s. P. M. Jellalabad time.

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* The time stated being erroneous, is omitted.

My camp was pitched about two miles North-west of Kulsea on the South bank of the Nowgong Row, (or stream,) but so feeble was the intensity of the shock, that although I was conscious of some peculiar motion at the time, it never occurred to me that it arose from an Earthquake, and it had passed from my mind till recalled by Mr. Pigott's account of what had been felt at the same time at Kulsea.

Mussoorie, in lat. 30° 30′, long. 78° 10′*, forms the most easterly limit of the Earthquake of the 19th February, in so far as my information extends. A merely incidental notice, in a Meteorological Register kept by Major Aitchison at Mussoorie, informs me of its having been experienced there. The shock, however, appears to have traversed a large portion of the Himalayan chain, since I am informed by Capt. Hutton, that it was felt at Shalkur on the borders of little Thibet, by Lieut. D. Cunningham of Engineers.

It therefore appears from the preceding details, that the tract affected by this Earthquake is, so far as determined by authentic intelligence, extended from the 69th to a little beyond the 78th meridian of East longitude, and from between the 34th and 35th to between the 28th and 29th parallels of North latitude. The superficial area thus affected, amounts to nearly 216,000 square miles, and within it are included mountain masses of great extent, varying from 2 or 3,000 to 10 and 12,000 feet in height above the level of the sea.

The general course of the shock was from East to West, parallel with that of the range of the Himalayas. Its mode of propagation appears to have been analogous to that of the waves generated when a flexible piece of metal or other substance is seized at one extremity and shaken violently. A succession of waves flow along the course of the disturbed body, following each other rapidly until the moving force is withdrawn, and thus it appears to have been with the Earthquake under review. A series of great waves were generated on the 19th, and propagated, with an undulatory motion to a great distance, and series of smaller ones continued for upwards of a month afterwards to be continually formed, but propagated only to a very limited extent, but all in the same direction with the first mentioned.

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* The geographical positions of places in India are taken from the table of latitudes and longitudes published in Rushton's Gazetteer. They are not always strictly correct.

As some remarkable instances of disturbance of the magnetism of the earth are recorded to have occurred during Earthquake shocks, it struck me that similar phenomena might possibly have been observed on the present occasion at the Simla Magnetic Observatory, and I therefore wrote to Major Boileau of Engineers, the Superintendent, on the subject, and he was kind enough to reply as follows, under date 5th November, 1842:—

"The magnetometers have been watched with great care during (*i. e.* on and after) the occurrence of Earthquakes, and there never has been any disturbance in their mean readings, though the mechanical effect has been apparent by the vibrating motion communicated to the instruments. The delicacy of our magnetic instruments is such, that a movement equal to two seconds of arc would be detected immediately, and I hold the total absence of any such indications, as almost amounting to proof, that Earthquakes are not magnetic phenomena."

If the observations at the Simla Observatory are to be held as decisive on the point, then certainly it is a just inference, that no connection exists between Earthquakes and disturbances of terrestrial magnetism; but as these observations may be opposed by numerous others indicating distinctly I think, such a connection, although the precise nature of it is yet mysterious, Major Boileau's inference must be looked upon as premature, and his observations prove, it appears to me, nothing more than, that at Simla, the Earthquakes have hitherto produced effects only mechanical, but it by no means thence follows, that Earthquakes generally are not in any respect magnetic phenomena. The question is still an obscure one, and the observations which have led to the impression that the causes of Earthquakes are connected with terrestrial magnetism have been made chiefly in districts where volcanic forces are in actual operation, and where the causes of Earthquakes, whether of terrestrial or atmospheric origin, are in full activity, circumstances to which no analogy is presented at Simla, since I am not aware of there being in the vicinity of that place, one single proof of active volcanic agency. The question will doubtless be farther elucidated ere the labours of the various magnetic observatories are closed, but it is unnecessary to dwell longer upon it now, as it will again come under notice at a subsequent period.

The following table presents a general view of the course and phenomena of the Jellalabad Earthquake, and with it, the account of this remarkable event will be closed:—

TABLE.

Places affected.	Geographical Position.		Period of Shock.	Time from point of greatest force.	Approx. Distance in degrees of Long. from point of greatest force.	Remarks.
	Lat.	Long.				
Cabool, ..	34° 30′ 30″	69° 7′	Not specified.	..	..	Shock very severe.
Jellalabad,	34 25	70 30	$11^h\ 40^m\ 0^s$	..	..	Point of greatest force.
Peshawur,..	34 06	71 42	11 41 12	0 1 12	1 12	Shock, very severe.
Ferozepore,	30 56 50	74 35	11 48 40	0 8 40	4 05	Shock, smart.
Delhi, ...	28 40	77 16	11 53 56	0 13 56	6 46	Ditto do.
Poojnah, ..	29 32	77 27 ?	0 00 12	0 19 12	6 57	Ditto do.
Saharanpore,..	29 57	77 32	Not specified.	..	7 02	Shock, slight.
Kulsea,....	30 08	77 34	0 3 44	0 23 44	7 04	Shock, very slight.
Mussoorie,.	30 30	78 10	Not specified.	..	7 40	Shock, smart.

2. EARTHQUAKE OF THE 5TH MARCH, 1842.

On the evening of the 5th March, 1842, a very severe shock of an Earthquake was experienced at several stations in the North Western Provinces, about 9 o'clock P. M. Judging from its effects, it appears to have emanated from the interior of the Himalaya, since the stations in and near the hills were much more seriously affected than those at a distance from them. Thus the effects of the Earthquake at Mussoorie, (lat. 30° 30′, long. 78° 10′), about 7,200 feet above the level of the sea, were much more severe than at Saharanpore. In Major Aitchison's Meteorological Journal, the following details of the shock are given :—

"5th March. Thermometer at sunrise 62°, wind East. Thermometer at sunset 58°, wind as in the morning, weather clear. At ten minutes past 9 P. M. a most violent shock of an Earthquake, which lasted about a minute Colonel Young's house at Deyrah was much injured, also Major Thompson's at Mussoorie, and Lord Henry Gordon's at Landour was rent from top to bottom," venetian blinds also rattled strongly, lamp glasses were violently shaken, and the oscillations causing these effects appear to have come from North to South.

The motion of the Earth from all accounts appears to have been horizontal, and the nature of the shock was wholly distinct from that of the preceding Earthquake; all who experienced both assuring me, the difference was perceptible to them at once. The effect in the present instance, instead of being like the rounded swell of a fluid or viscid mass, was sharp and sudden, like the effect of a concussion than of an undulation, and seemed indeed to be a much magnified "jarr," similar in kind to that experienced by the hand when a hammer held by it is struck on a hard unyielding body. One intelligent friend who was in his study when the shock occurred, described his sensations to be, as if he and his chair had received a sudden and severe blow from behind, and been both; impelled forward, and this appears to have been the characteristic of the shock.

The following interesting details of the Earthquake as experienced at Berkeri on the Doab Canal, were communicated to me by Sergt. and Overseer J. Petrie, to whom I feel much obliged for his trouble in preparing them :—

Letter from Sergt. J. Petrie to my address, dated 5th March, 1842.

SIR,—We had a very smart shock of an Earthquake here this evening at about 9 o'clock : so much so indeed, that every thing in this bungalow shook and rattled again. I had just laid down to rest with a book in my hand when it came on, and I started up and called out for assistance, thinking the house was coming down. Every one about the place felt it, and came running to me. I found the South door of the inner room, which I had bolted before I went to bed, had been forced open by the bolt falling down. Indeed every thing in the house shook, and I was very much afraid of its falling, after having read the accounts from our Army near Peshawur. At that place a number of houses have been destroyed, and many lives lost from the last Earthquake.

"Although this shock did not last so long as the one of the 19th of last month, in my opinion it was much more severe for the time.

I am, &c. &c.

J. PETRIE."

The rate of propagation of this shock appears to have been very rapid, as no perceptible difference in its period of arrival was observed at any of the following stations; namely, Simla and Mussoorie in the Himalayas, Deyrah in the Deyrah Dhoon, Saharanpore and Berkeri. The nature of the shock would indicate that the seat of the disturbing force must have been within the rocky crust of the earth, or at a very small distance indeed beyond it, as such a supposition accounts best for the peculiar "jarring" sensation characteristic of the shock. All who experienced the Earthquakes of the 19th of February and 5th of March, concurred in opinion, that they came from opposite directions, and as the former was from West to East, the latter must have been, as before stated, from Northto South, and this is in some measure confirmed by the fact stated in Sergt. Petrie's letter, that the Southern door of the inner room of the Berkeri canal bungalow was driven open by the shock, as it would receive the first impulse.

3. EARTHQUAKE OF THE 21ST OF MAY, 1842.

The Earthquake of the 21st of May, experienced in the Lower Provinces, appears to have been only a slight shock, and its direction, in so far as this can be determined from the facts communicated, was from South-west to North-east. The most Westerly point from which I have received any intelligence of its effects is Juanpore, a station about forty miles to the North-west of Benares, the latter being in lat. 25° 30′ N., long. 83° 1′ E.

The following letter from Vincent Tregear, Esq. furnishes an account of the shock as felt at Juanpore :—

Juanpore, 29th May, 1842.

"DEAR SIR,—I have to-day received the Journal of the Asiatic Society, No. 123; and as you invite communications regarding Earthquakes, I hasten to inform you, that a slight shock was felt here on the 21st inst. between the hours of 8 and 9 A. M. I did not, I regret to say, note the time, because I found that no one else in the house noticed the shock. In the evening I met Mr. Tulloh, who asked me if I had 'felt the Earthquake?' shewing that it was not mere imagination on my part. The motion seemed to be North and South. It was in reality nearly vice versâ," but without reference to some standard indicator of direction, it is impossible from mere sensations to tell the direction of a shock correctly.

"The weather," Mr. Tregear continues "here is exceedingly oppressive, and if such a state of the atmosphere can be considered as prophetic, I think we have more natural or unnatural convulsions at hand. It is more than possible that chemical or mechanical changes in the interior of the earth have great electrical influence on the surface; and these changes may be accompanied by perceptible vibrations.* * * * *

Faithfully yours,

VINCENT TREGEAR."

I shall have occasion in another part of this memoir to allude to some interesting atmospherical phenomena which have been found to accompany Earthquake shocks, but as this Register is intended to be simply narrative, I do not at present make any comment on Mr. Tregear's remarks.

The next place from which we have any record of this Earthquake having been felt is the city of Patna, in lat. 25° 37′ N. long. 85° 15′ E. Our information is limited to the following extract from the Calcutta *Englishman* of the 28th of May:—

"A letter from Patna," the Editor states, "mentions that a smart shock of an Earthquake was felt there at 8h. 36m. A. M. on the 21st instant."

The shock travelled next to Darjeeling, in lat. 27° 00′ N. and long. 88° 36′ E., and situated at a height of about 7,000 feet above the level of the sea. The following letter from Arch. Campbell, Esq. Superintendent of Darjeeling, gives details of the shock as experienced at that place:—

Darjeeling, June 4th, 1842.

MY DEAR SIR,—I have seen your account of the Earthquake of the 19th of February last in the last number of the Journal of the Asiatic Society, and in compliance with your desire therein expressed to be furnished with notices of Earthquake shocks occurring in all parts of India, I have to inform you, that a slight shock was experienced at this place on the morning of Saturday, the 21st of May last, at or nearly about 10 minutes past 9 o'clock A. M. I call the shock a slight one, because it was not sensible to every person at the station, and because there was no damage done to houses or other property. It was experienced by a person in my house, although I was not aware of its occurrence. I was engaged dressing at the time, and standing, while the other person was sitting in another room reading. The sensation is thus described: "I was seated on a chair opposite to the fire when I felt a hitching motion sideways. This was repeated two or three times, and was not accompanied by any noise." The chair was placed East and West, so that the course of the shock would appear to be North and South; but whether from the South to the North, or vice versâ, the person describing it cannot say. A gentleman at the Hotel, one mile North from my house, describes the shock as having been more severe. He was also dressing at the time, and staggered into his bearer's arms, after which he had a feeling of nausea which continued for some hours. At Mr. Maddock's house, one and half mile to the South of mine, the shock is described as having been more violent than it was felt at my house, or to the North side of it.* * * * * * Your sincerely,

To R. Baird Smith, Esq. A. CAMPBELL.

I have had frequent cause to be indebted to Dr. Campbell for details of Earthquakes experienced at Darjeeling, and I take this opportunity of acknowledging my obligations to him, not only for the assistance he has afforded me, but also for the general interest he has taken in the subject.

Correcting the time at Patna for difference of longitude, and assuming that observed at Darjeeling to be, have

	h.	m.	s.
Time of shock at Patna, ..	8	48	40
Time „ at Darjeeling,	9	10	00
Difference,	0	21	20

4. EARTHQUAKE OF THE 4TH JULY, 1842.

A report of an Earthquake on the 4th July, was communicated to me by Sergt. Buttress, Overseer on the Delhi Canal, through Capt. Baker of Engineers. No other notice of this Earthquake has reached me, but Sergt. Buttress gives the details so circumstantially, that I can scarcely think he was mistaken, and the fact of his being the only one to communicate an account of it, is in no degree remarkable, since the interest in natural phenomena generally is in this country confined to a very limited circle, and numbers of these pass without any record at all. On the authority of Sergt. Buttress' letter, I therefore include this Earthquake in the Register.

Letter from Sergt. Buttress to Capt. Baker, Engineers, without date.

SIR,—As some gentleman of Engineers, whose name and address I have forgotten, has solicited information of any Earthquake that may take place, I beg leave through you, Sir, should you be acquainted with the name and address of the gentleman, to forward the following notice of one that took place at Chotah Thannah, on Monday the 4th of July, at 10 minutes to 3 o'clock P. M. by my watch, which I have since ascertained by the mid-day gun at Delhi, to be five minutes too slow, so that the time was five minutes to 3 o'clock.

It lasted about thirty seconds, and was accompanied by a rumbling noise, exactly like one of the water mills in Delhi. The motion was a violent trembling, and the direction seemed to me to be from West to East. The whole day had been dreadfully close, and scarcely a breeze blowing; but in the evening the wind rose, and has been very fresh. From yesterday up to the present moment, a dust storm has been blowing from the North-west. I have, &c. &c.,

W. BUTTRESS, *Sergt.*
Ovr. C. D.

5. EARTHQUAKE OF THE 21ST JULY, 1842.

The Earthquake of the 21st July was experienced at Jellalabad, and the following extract from the *Agra Ukbar* of the 4th August, gives the only notice of it that has appeared. "A severe shock of an Earthquake was experienced at Jellalabad on the 21st July 1842, at a little past 9 P. M. A reduction of temperature followed it." I am not aware whether or not this shock extended beyond the valley of Jellalabad. The perceptible reduction of temperature which followed it, is the only point of interest connected with this shock.

6. EARTHQAUKE OF THE 25TH JULY, 1842.

The immediate vicinity of Delhi alone, appears to have been affected by the shock of the 25th July. How far its effects may have extended, there are no precise data for determining, but it was evidently a merely local convulsion, and probably was felt only within fifteen or twenty miles around the city. The following Extract from the *Delhi Gazette* of the 27th July, gives an account of the phenomenon:

"A smart shock of an Earthquake, accompanied by a loud rumbling noise, woke the inhabitants of Delhi from their sleep at about a quarter to four on the morning of the 25th. It did no damage that we have heard of."

7. EARTHQUAKE OF THE 7TH SEPTEMBER, 1842.

This Earthquake was experienced at Mussoorie in the Himalayas. The shock was very slight, and occurred during a severe storm at 1h. 58m. P. M. The nature of the Earth's motion was vertical, and the vibration single. The direction appeared to be from West to East, the duration of the shock was estimated at five seconds. It was not, to the best of my knowledge experienced in the Deyrah Dhoon, or any where in the Plains, as might have been anticipated from the slightness of the shock at Mussoorie.

Having been informed that at the moment of the occurrence of this Earthquake, Dr. Anderson of the Horse Artillery, had experienced sensations precisely similar to those accompanying an electric shock, I felt anxious to verify this interesting fact, and accordingly wrote to Dr. Anderson on the subject, who obligingly favoured me with the following reply:—

Letter from F. ANDERSON, *Esq. to my address, dated Mussoorie,* 21*st November*, 1842.

MY DEAR SMITH,—I certainly thought that at the time of that slight Earthquake, with the movement, that I also experienced a slight electric shock extending from the left elbow to the fingers. I was then up at "Rochville," at the very extremity (East end) of Landour. I was in the room with Mundy and two ladies, one of whom I was seated close to, she and I felt the movement distinctly, the others did not. *I alone* was conscious of the electric feeling. * * * * * *

Yours very sincerely,
F. ANDERSON.

Electric shocks frequently have been felt during Earthquake shocks, and it is interesting to find this phenomenon accompanying such event in India, as well as elsewhere.

8. EARTHQUAKE OF THE 18TH SEPTEMBER, 1842.

The Earthquake of the 18th September was experienced at Darjeeling, and from that station only has any notice of it reached to me. The following extract from a letter from Dr. Campbell, furnishes details of the shock as experienced at Darjeeling:—

"On the morning of the 18th September, 1842, at half-past 4 o'clock, as nearly as I can determine from the comparison of watch times given by three gentlemen with the time by sun-dial and their watches on the following day, there was a smart shock of Earthquake felt at Darjeeling. Two of those gentlemen, who have given me particulars of their sensations, say, that it appeared to them to have come from the North-west and passed under them to South-east. The third says, he felt it as an "up and down" shock, and that the movement of the earth was sensible for some seconds after it was evident that the shock had passed."

Assuming the direction stated to be correct, it is not improbable that this shock emanated from the valley of Nepaul, the seat of the great Earthquake of 1833. But this of course is merely a conjecture, as evidence is wanting to warrant more.

9. EARTHQUAKE OF THE 26TH SEPTEMBER, 1842.

This shock was experienced at Delhi, and like that of the 25th July, appears to have been strictly local in its character. It is described as "a very smart shock of an Earthquake, accompanied by a tremendous rumbling, and lasted not less than two or three minutes." It occurred about 9 A. M., and Mr. Bingham informs me, its direction was apparently from W. to E.

10. EARTHQUAKE OF THE 27TH SEPTEMBER, 1842.

The vicinity of Delhi was the seat of this Earthquake also, which was slight in its character, and came in the same direction as the preceding. Beyond the movement of the Earth, no other effects were perceptible.

The repeated local shocks to which the neighbourhood of Delhi is subject, prove distinctly, that a focus of active Earthquaking force is situated close by it. And in looking for the locality of this, I have no hesitation in fixing it in the Aravulli range of hills which skirt Delhi, and run in a South-westerly direction from it. The occurrence of the hot springs at Loweah, the disrupted state of the rocks composing the range, the occurrence of secondary trap in abundance, all shew that disturbing forces have existed, and still do exist there. I am confirmed in this opinion, by the result of Mr. Bingham's observations, who has informed me, that all the different local shocks of Earthquake experienced in Delhi, appeared to him to emanate from this range of hills. The limited extent over which the shocks are felt, shews, that the seat of the disturbing force cannot be far from the surface of the earth, while their comparatively feeble intensity proves, that the force itself cannot be of a very energetic character. I shall have occasion in a subsequent part of this memoir to shew grounds for inferring, that its effects being the standard of comparison, the disturbing force has diminished perceptibly in energy within the last few centuries. To say whether the force emanates from a central point, or whether it acts on a line of some extent is impracticable, with observations indefinite as those hitherto furnished; but if instruments for recording Earthquake shocks are ever employed in India, Delhi ought to be one of the places selected for establishing them at, and from their indications these and other points of interest may be determined.

11. EARTHQUAKE OF THE 23D OF OCTOBER, 1842.

This Earthquake was experienced at Gowahatty, Assam, in lat. 26° 00′ N. and long. 90° 40′ E., and at Chittagong in lat. 22° 22′ N. and long. 91° 42′ E. At the former place its effects are thus described by a correspondent of the *Friend of India:* "Oct. 23. Between 8 and 9 o'clock A. M. there was a shock of an Earthquake; the motion was tremulous, and lasted about half a minute." From Chittagong another correspondent of the same paper writes: "we had another Earthquake here; not so severe as the last on the 23d ultimo. The motion was in the opposite direction (*i. e.* from East to West) and stopped one of the above-mentioned clocks which vibrate N. and S. at 9h. 42m. A. M."

It is stated that most, if not all, of the Earthquakes experienced in Assam came from the Eastward. It is therefore probable, that a centre of active force is situated somewhere here in the Singhpho or Eastern extremity of the Naga hills, which bound the province on the East. I am too imperfectly acquainted with the localities in question to be able to say whether there are any physical or geological facts that throw light upon this idea, and it is suggested only by the uniform regularity of the direction of the shocks.

12. EARTHQUAKE OF THE 25TH OF OCTOBER, 1842.

This was experienced at Jellalabad at half-past 1 A. M. It is characterised as severe, but it appears to have been one of the local shocks so frequently felt throughout the valley in which that city stands.

13. EARTHQUAKE OF THE 29TH OF OCTOBER, 1842.

The Earthquake of the 29th of October was felt at Gowahatty, Assam, and forms an exception to the general rule as regards direction before stated, since the vibrations travelled from North to South. The correspondent of the *Friend of India,* before quoted, thus describes the shock: "October 29th. At half past 7 P. M. a second shock occurred. The motion was from North to South, as appeared by the liquids in decanters on the dinner table. The shock was gentle, and the motion lasted about half a minute, when it was gently repeated."

14. EARTHQUAKE OF THE 6TH OF NOVEMBER, 1842.

This was another of the local Delhi shocks, and was experienced at 1h. 30m. P. M., on the 6th November. Mr. Bingham in communicating its occurrence to me remarks, that it makes the eighth shock experienced in Delhi during the year. Five of these are recorded in this Register, two occurred before it was commenced, and the eighth was probably that of the 5th of March, although no notice of its having been felt there has reached me. Out of these eight, six were local and primary shocks, emanating from a focal tract in the immediate vicinity of the place, while the remaining two were secondary, and transmitted from distant and distinct centres.

15. EARTHQUAKE OF THE 11TH OF NOVEMBER, 1842.

The Earthquake of the 11th of November, one of the severest that had been felt for years, was confined in its influence to the Lower Provinces. Its effects at Calcutta will first be detailed, and its course then traced Eastward and Westward from that place.

I place the following Extract from a letter from H. Piddington, Esq. first among the notices of the shock at Calcutta, because it furnishes the most accurate and trust-worthy information relative to the period and direction of the shock as experienced there. The time, as given by Mr. Gray, namely 9h. 38m. P. M. will be assumed for comparison with the times at other places, and these will all be reduced to Calcutta time.

Extract from a letter from H. PIDDINGTON, *Esq. to my address, dated 24th November,* 1842.

"I learn from the watchmakers (Mr. E. Gray, the first in his profession here,) that the true time of the shock was 9h. 38m. Its direction, from the swinging of pendulums, was from about E. N. E. to W. S. W. If I hear any thing more, I shall not fail to note it for you, and I add at bottom a copy of our note made at the meeting. I was acting as Secretary for Mr. Torrens, and it did not occur to me to examine the Barometer; but I found no difference afterwards at home, and a friend who has an excellent simpiesometer assures me, that no effect was produced upon it, he having examined it immediately afterwards, so that in slight shocks the atmosphere seems to have no share.

Yours very faithfully,
H. PIDDINGTON.

The note alluded to above by Mr. Piddington, as having been made at the meeting of the Asiatic Society, is as follows: "At ——* the proceedings of the Society were interrupted by two or three slight vertical shakes or heaves of the Earth, with a noise like the rumbling of a passing carriage, and one strong horizontal shake from East to West, or from N. E. to S. W. The whole took place within about a minute of time." (Signed) H. T. PRINSEP, *President.*

The following extract from a letter from J. McClelland, Esq., gives some further details of interest, and shews that the Barometer was seriously affected during the shock: "With regard to the Earthquake of the 11th November, the only information I am able to give you that has not appeared in the Calcutta papers is, that the mercury rose and fell repeatedly, to the extent of seven or eight tenths of an inch during the shocks in a Barometer on the second floor of St. Xavier's College, a house in Chowringhee. The inmates of which house also describe the water in a large pond, of about three hundred yards in length and seventy in breadth, extending lengthways North and South, to have risen into considerable waves. This was also the case with the River, which appeared agitated, as if a steamer had passed. This refers to the river at the Botanic Gardens, where it is not half so broad as it is at Calcutta. A clock in the house of the Superintendent of the Garden, which had gone regularly for years, stopped suddenly during the shock. I observed three distinct shocks, they seemed to me to be rather a tremulous motion than a waving in any one direction; but others observed a distinct direction of the shock; however, people are not all agreed as to what this exactly was. Probably the form of different masses of building, such as our houses in Calcutta, might occasion some little difference in the effects of the Earthquake on the sensations of different persons."

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* Time omitted as erroneous.

A remarkable luminous appearance of the water in the river, as observed on board the ship *Southampton*, is thus described by a correspondent of the *Englishman* of November 14th.

"Several gentlemen had just before the time been conversing upon the poop, when one pointed out the very singular luminous appearance of a portion of the river water: its Southern limit setting from N. W. towards Chaudpaul Ghaut. It was thought at first to be merely the first ebb of the tide setting down, or from the reflection of the moon, but it proved in the sequel not to be the first, and the moon was just then densely obscured by clouds, proving that also not to be the cause. On this brightness closing upon the ship, a general and severe tremor was felt throughout, as if a taut chain cable was grinding under the keel, or that a sudden squall had struck the ship. The Barometer had slightly fallen previous to this, whether from the preceding rain or caused by the Earthquake it is for others more capable to judge: I am inclined to think from the latter. From enquiries amongst several commanders, it appears, that amongst the northermost ships it was more severely felt, even to the shaking of the chain cables and cabin furniture.

"At Howrah also, we find the shock was violent in the extreme. We may therefore infer that the direction of the Earthquake must have been from N. W. to S. E."

It is stated by a correspondent of the *Englishman* of the 14th Nov., the night of the 11th was particularly close and oppressive in Calcutta. The meteorological registers kept at the Surveyor General's Office and the Honorable Company's Dispensary, present nothing remarkable farther than that rain fell on the evening of the 11th to the amount in the lower gauge of 0.14, and in the upper of 0.19 inches, none having fallen for sometime before.

The effects of the Earthquake at Serampore, about fourteen miles above Calcutta, (lat. 22° 45′ N. long. 88° 26′ E) are described in the following extracts :—

In the *Friend of India* of the 17th Nov., it is stated in the weekly summary of events, that on the evening of the 11th Nov. at about 9h. 50m. or 9h. 45m. by the town-clock, a very severe shock of an Earthquake was experienced at Serampore. "It was accompanied by a noise which at first refembled some "mighty rushing wind," and then the loud rattling of carriages over a stony street. The shock came from the Eastward: the clocks of which the pendulums vibrated from North to South were stopped, while those which stood East and West continued going. So violent a shock has not been experienced in this part of the country for the last twenty-five years. There was an unpleasant stillness in the air previous to this occurrence, but the wind rose strongly from the Eastward almost immediately afterwards."

In the *Bengal Hurkaru* of the 14th of Nov. the following details are given: "On Friday the 11th instant, at about a quarter before 10 P. M. two severe shocks of an Earthquake were felt at Serampore. They were preceded by a rumbling noise from the N. E. towards S. W.; the undulation was very great: all the houses at the place were shaken, and those persons who had retired were obliged to jump out of their beds, and some even quitted their houses, but through the mercy of Providence, no injury was done. The Brahmans as usual were busy with their shauncks and drums. The Earthquake lasted about four or five seconds."

In the other notices of the shock at Serampore which I have received, there are no new facts, so that I do not insert them. The time stated above is, I believe, incorrect, and considerable difference of opinion exists as to the duration of the shock. Such difference always will exist, so long as mere sensation is made the measure of duration, and proper instruments alone can remedy this imperfection.

Darjeeling is situated within one minute Eastward of the meridian of Calcutta, and I therefore give next, a notice of the shock as felt there. For this I am indebted to Dr. A. Campbell.

Letter from DR. CAMPBELL *to my address, dated Darjeeling,* 18*th November*, 1842.

"On the night of Friday the 11th instant, we had a shock of an Earthquake at this place. Although not in bed or asleep at the time it occurred, I was not conscious of it. Still it was, a smart shock, according to the accounts of those who experienced it. The ghurree at the Treasury Guard struck 10 o'clock, as the shock was felt by many persons, and one gentleman looked at his watch and found it was ten minutes past 10 P. M.—suppose, as there is no way of getting the exact time of the shock's occurrence, that it happened at 5 minutes past 10 P. M. It was so severe as to bring down pieces of plaster from the walls of "Caroline Villa" and "Mount Pleasant;" and *the* shock was succeeded soon after by a slighter one, or perhaps it was but one shock with a remission in the vibration. One person thought it came from the South and passed on to the North. I account for the shock not having been felt at my house where there was a party of seven at the time, from its being constructed of wood, which from its greater elasticity is not to be shaken to the same extent as a pile of bricks or stone.

Yours, &c. A. CAMPBELL.

The following extract from the *Englishman* of the 16th Nov. details the effects of the Earthquake as experienced at B——, a place fifty-five miles East of Calcutta.

"Arrived at B—— (fifty-five miles East of Calcutta on the Isamutta or Jaboona) at half-past 5 A. M. 12th Nov. and found Mr. —— and his family still in great alarm from the Earthquake, which they had experienced there on the previous night. Mr. —— told me that immediately his family had retired at half-past 9, his dogs and those of the neighbouring village began howling, and shortly after was a loud rumbling, similar to that of carriages going over a draw-bridge. The commencement of this was followed by a violent undulation of the ground from North to South which actually rocked the house, and ended by three or four hard shocks which threw open all the doors and windows previously shut in for the night. The house (a puckah-built upper-roomed one) cracked, and the plaister from several of the walls and ceilings was thrown down. On examining the house by daylight we found rents in several of the walls and arches of the house, and the verandah to the East separated from it. Mr. —— considered the Earthquake, from the first hearing of the rumbling noise to the last shock, to have occupied about one minute of time.

I was on the road to B —— in my palkee, in the first stage from Barraset, and did not feel the Earthquake, but I noticed at 8 P. M. to my wife who was with me, that the weather was unusually warm, cloudy and threatening heavy rain: she called out to me about half past 9, that it thundered, and we had heavy rain on the road from half past 8 P. M. to 2 A. M.

It did not rain at B—— during the Earthquake, but it did so the preceding afternoon from 3 to 5 o'clock, and the weather all day had been sultry; the same was experienced in Calcutta.

Mr. ——'s Pundit arrived at B—— at 10 A. M. on Saturday the 12th. He was in a boat in the Sóonderbuns, and stated that the waters were much agitated, and his boat was tossed about as if by waves in a squall of wind."

The Editor of the *Englishman* appends to the above the following note:—

"We learn from another quarter, that the shock of the Earthquake was severely felt on board the *Agincourt*, about fifty miles South-east of the Floating Light at 9h. 30m. A. M."

At Acra on the bank of the Hooghly, about five or six miles below Calcutta, the shock seems to have been very severe. The house of Mr. Greenfield there is represented as having been rent from top to bottom in twenty different places. He states, "it was so severe that the doors rattled so that you could not hear yourself speak, and the mortar from one end of the house to the other was flying down in handfulls. We had four shocks, three first and one about a quarter of an hour afterwards: empty bottles were broken at the mill, and the pigs and fowls, ducks, geese, dogs and horses made a most hideous noise. A little more and all would have been down, as the beams began to start."

At Pubnah (lat. 24° 32′ N. long. 89° 12′ E.) the shock was experienced at 9h. 47m. Calcutta time. Another slight shock occurred at 10h. 30m. C. T. The direction here was from S. W. Two indigo boiler chimneys and that of a rum distillery were thrown down, and the banks of the river in front of the distillery are said to have been fissured. The correspondent of the *Englishman*, however, who gives these details of the effects of the shock, is so remarkably facetious, that suspicions of exaggeration are excited.

At Barrisaul (lat. 22° 45′ N. long 90° 11′ E.) the shock appears to have been felt at very nearly the same time as at Calcutta, the period being 9h. 38m. 12s. C. T.

The following letter published in the *Bengal Hurkaru*, gives an account of the Earthquake as experienced at Barrisaul:—

" As I dare say that the shock of Earthquake which was felt here will have been likewise experienced at other stations with more or less severity, accounts of which will doubtless be communicated to you, I lose no time in telling you now, that a very severe shock was felt at a quarter to 10 P. M. at this station yesterday (Nov. 11th); although no accident occurred, considerable anxiety was caused by the length of time the Earthquake lasted. The heaving of the ground appeared to travel from E. to W. and continued with violence for about one minute. The river was greatly agitated, so much so, that the serangs of several pinnaces came on shore, unable to account for the extraordinary motion of the water.

" I send down this account, because I imagine that an Earthquake of such severity having been felt at a place where its occurrence is so unusual must have extended elsewhere, and all information on the subject may prove interesting.

" P.S.—The weather for the last few days has been remarkably warm for the season of the year; the variation in the Barometer has not been great. The Earthquake was accompanied by a rumbling noise, similar to that caused by heavy ordnance passing over the ground."

At Gowahatti, Assam, (lat. 26° 00′, long. 90° 40′ E.) the shock was felt very slightly. Its period there was 10h. 00m. 56s. C. T. A correspondent of the *Friend of India* describes the motion as merely tremulous, but sufficient to attract the attention of four persons who were seated together at the time.

The shock was felt more severely at Chittagong, (lat. 22° 22′ N. long. 91° 42′ E.) probably because it had to traverse only alluvial lands, and had no mountainous tracts, as in Assam, to decrease its force. The period as given by two tolerably correct clocks, was 9h. 42m. 48s. C. T. The direction of the oscillation was from North to South, as determined by the motion of hanging lamps, &c.

The only place at any distance to the westward of Calcutta, whence any notice of the shock having been felt has reached me, was Monghyr (lat. 25° 02′ N. long. 86° 29′ E.) where a portion of the fort wall is said to have been brought down. No farther particulars have come under my observation, and I am unable to state either the time or direction of the shock at that place. At Baughulpore (lat. 25° 13′ N. long. 86° 58′ E.) I am informed by Mr. Piddington, that the shock was *not* felt.

It therefore appears that, *in so far as the facts collected extend,* the tract affected by the Earthquake of the 11th November 1842, was bounded on the North by Darjeeling, on the East by Chittagong, on the West by Monghyr, and on the South by the position of the ship *Aginc[illegible]t,* thus including about five degrees of longitude and five of latitude. That to the Eastward and Southward, and probably to the Northward also, the shock extended beyond the limit here assigned, can scarcely be doubted, from its intensity at the places specified as the bounding points of the tract in these directions, but there is no information available to prove that it did do so, and I am unwilling to venture upon conjecture.

It will have been observed, that at different places the shock appeared to travel in every different direction. Thus :—

At Calcutta, the direction was from E. N. E. to W. S. W.
At Pubna, „ from S. W. to N. E.
At Darjeeling „ from S. to N.
At Chittagong „ from N. to S.

Now, it appears to me, that the only way in which these statements can be connected and rendered consistent, is to conceive the undulations of which the shock was composed, to have been propagated in a manner analogous to waves formed in water when a stone is thrown into it. Proceeding thus in all directions from a central point, the undulations would seem to observe to come from different directions, dependent on their position, relative to the centre whence the undulations had emanated. Of course waves propagated through the crust of the earth could retain but little of that perfect symmetry characteristic of waves in a homogenous fluid like water, since their forms would necessarily be modified by the variable nature of the strata through which they were being transmitted, and hence departures from strict theoretical accuracy of direction are to be anticipated. Assigning therefore a certain degree of *circularity* to the undulations of the Earthquake of the 11th Nov. and conceiving the centre of emanation to have been some little distance to the N. E. of Calcutta, it will be found that the observations on direction become to some extent, consistent. At Calcutta the course would appear to be from N. E. to S. W.; at Pubna from S. E. to N. W. instead of from S. W., as stated before; at Darjeeling from South to North; and at Chittagong from the opposite direction. Some of the observations made, as at Barrisaul, do not correspond strictly with this view, but many sources of error exist when sensations are taken as the only guides, and by these it is possible the observations may have been affected. The idea of the circular propagation of the undulations is suggested only as a method of connecting the facts, and farther than it does so, I have no wish to claim any authority for it, the observations on which it is founded being too indefinite generally, to warrant this being done.

16. EARTHQUAKE AT BARODA, 1842.

I regret that I have been unable to ascertain more regarding this Earthquake than that it occurred during the year 1842. I am therefore able only to record it, a circumstance I regret the more, as Baroda lies in the usual track of the Earthquakes of the Delta of the Indus, and it would have been interesting to ascertain, whether this shock had emanated from that focus, or was independent of it.

The Register is now completed, and I defer all comment upon the phenomena of the Earthquakes recorded in it, until the completion of the second part of this Memoir, when the phenomena of Indian Earthquakes generally, will be analysed.

Remarks on some of the disturbing causes in Barometric Observations. By Captain SHORTREDE, *First Assistant, G. T. Survey.*

If the barometric oscillations were perfectly uniform in different situations, it would obviously be a matter of indifference, theoretically, at what times of the day the observations might be made, provided they were simultaneous. But it is well known to those who have examined the subject, that the oscillations though tolerably uniform in low latitudes, are subject to particular variations, the causes of which are often not easily assigned. Whatever these causes may be, it is by no means likely that their effect will be transmitted instantaneously through a long column of air, and hence it appears desirable, that the comparative observations should be made about the times of maximum and minimum of the atmospheric tide, when, the variations for a considerable time being almost insensible, it may be supposed that the causes will act with least disturbance. Another practical reason for selecting the times of maximum and minimum is, that perfect simultaneousness being seldom to be expected, it is evidently of advantage to select for observation those times at which the want of this condition will produce the least effect. About the middle of the tide, the barometer generally will vary as much in the course of five minutes, as it will in half an hour from the time of maximum or minimum.

Though these remarks seem true as far as they go, yet in particular cases, the atmospheric tides may be so affected by circumstances of locality, as to present anomalous results. I am unable at present to quote the documents containing the observations which gave occasion to what I am now about to state, but the results were so uniformly and repeatedly observed, that beyond settling the precise numerical amount of discrepancy, the possession of the original observations would add little to the evidence.

When I was in charge of the Bombay Trigonometrical Survey, I made many barometric observations in the Dekhan and along the Sea Coast. These were compared sometimes with those made at the Engineer Institution in Bombay; sometimes with the observations made by Colonel (then Major) Sykes at Puna; and sometimes with those of a barometer left in Puna for the purpose. All the observations on the Sea Coast compared with those made inland from the face of the Ghats, as at Puna agreed in one result, but I shall confine myself more particularly to the results of a special comparison for determining the height of Puna above the Sea.

One of my barometers had been repeatedly boiled, I believe upwards of twenty times, and it was so perfectly free from air, that when set up, the mercury used to adhere to the top of the tube six inches above the level at which it stood when shaken. The tube was full 32 inches long, and the mercury adhered to the top at a station upwards of 4000 feet above the Sea, where the proper height of the mercury was about 25.05m. This barometer was compared for several days with one of Major Sykes' barometers, which I had filled and boiled, in which also the mercury used to adhere to the top of the tube. These two barometers used always to stand at the same height within a thousandth of an inch about the middle of the tide, but at the times of maximum and minimum, one of them used to range about two-thousands above and below the other. The difference to maximum and minimum being never less than '001, nor more than '003. We considered them to be the most perfectly comparable of any two barometers we had ever seen. Major Sykes' barometer remained on the spot where the comparisons had been made, while mine was carried to Bombay, and as the mercury still continued to adhere to the top of the tube, it plainly had not been deteriorated by the journey. Our observations were made simultaneously at 10 A. M and 4 P. M. for several days successively, but on calculating them, I found that the 10 o'clock observations always gave the height of Puna about 100 feet more than was given by the 4 o'clock observations. I ascertained beyond doubt, that there had been no mistake of a tenth of an inch in registering the observed heights. The like discrepancy continued at several other stations along the Sea Coast. This discordance of result being unvaried, naturally set me to consider what might be its probable cause: and the only cause I have ever been able to discover at all likely to account for the fact, is in the effect of the Sea breeze, which at that season of the year begins to blow about 8 or 9 A. M. along the coast, while towards Puna it is not felt till about 2 P. M. After blowing over the low lands in the Konkan, it is intercepted about midway by the Seihadri Ghats, which presenting an almost perpendicular scarp of from 2000 to 3000 feet, cause the air to accumulate over the low land, thereby increasing its barometric pressure to an amount equivalent apparently to about a tenth of an inch of mercury, corresponding to a column of about 100 feet of air, somewhat similar to the *head of water* produced by an obstacle placed in its current.

I am aware that some persons may be disposed to treat this statement as of little authority, for want of the actual observations on which it is founded. The fact, however, is tangible, and may be submitted to proof or disproof by any one who chuses to make the necessary observations.

The purpose for which I have made the statement, is to call attention to the influence of locality as affecting the results of barometric measurements. Different places may have particular times, at which it is unsafe to trust to barometric observations for correct results.

As there seems reason to suppose, that the principal deranging causes in barometric measurements are connected with the sun and wind, I have often thought that probably the results by night observation may be found to be more consistent than those by day observations. Unless experience should shew a more favorable time, I should prefer observations made about the time of the morning minimum of the tide, because so far as I have observed, the air is then more generally calm than at any other time. This, however, is a matter of fact, on which every one may judge for himself according to his means of knowledge.

I have been led to the same conclusion by endeavouring to trace the causes of the atmospheric tides, which I am disposed to refer entirely to the direct or remote action of the sun. The following is offered as an attempt to trace this action, and though perhaps not altogether satisfactory, it may lead to something better.

When the sun rises over China, the atmosphere there getting heated, expands and begins to flow off towards the west, where the sun is exerting no heating power. As the solar heat increases, the western efflux of atmospheric air increases, and goes on increasing till the sun is past the meridian. When the sun rises over India, a similar western efflux is occasioned, but for some considerable time the influx from the eastward being greater than the efflux towards the west, the atmospheric pressure goes on increasing, till by and by, the direct heating effect over India causes a western efflux at first equal to, and then greater than, the influx from the eastward. The atmospheric pressure thenceforward decreases, and it goes on to decrease so long as the heating power of the sun causes the air to expand. At the surface of the earth, this effect is greatest about 2 or 3 P. M., but it is not till the heated atmosphere has had time to ascend and dislodge colder air that the total effect is greatest. The atmospheric pressure is then a minimum. When the sun is exerting its greatest power over India, it has ceased to heat the countries to the eastward: the air over these countries being colder, presses on that over the countries to the westward, which is specifically lighter, until the air here being similarly cooled in like manner, proceeds to press on and displace the warmer air to the westward. When the influx balances the efflux, there is the evening maximum: after which the accumulated air gradually disperses itself till towards morning, when it is again pressed on before sunrise by the air heated in the east.

If this be a true account of the atmospheric tides, it is plain, that supposing the air to be calm, we may expect the disturbing causes will be least about the time of the morning minimum; and that at any time during the night if the air be calm, these are likely to be much less influential than during the day, for then they are entirely free from the direct action of the sun, which evidently has a great effect on barometric heights by the inequalities of temperatures which it occasions in different places. We know that even in the hottest weather, the temperature on the Sea Coast is tolerably uniform when compared with that of places inland, particularly when these inland places are on elevated plains. In such cases we cannot safely assume that the mean of the temperatures at the two stations will truly represent that of the intermediate column of air: or perhaps, to speak more properly, it cannot be assumed that the temperature and moisture at the upper station will approximate to those of a place on the same level immediately over the lower station; besides which, the barometric pressure at the inland station may be very different from that at the supposed station on the same level if, as is most likely, the state of the wind should be different in the two places. In short, any thing analogous to wind or current which would affect the correctness of water-levelling may be expected in a still greater degree to affect the correctness of barometric-levelling: and we may infer as a general conclusion that, besides the goodness of the instruments employed, the trustworthiness of barometric measurements will greatly depend on the care and skill with which the observers avoid the influence of disturbing causes.

11*th April,* 1842.

On Barometric Heights. *By Captain* R. Shortrede, *First Assistant Grand Trigonometrical Survey.*

If I remember rightly, your correspondent D has given a formula for computing Barometric heights, which to me appears to be neither so simple nor easy of recollection as that given by Professor Leslie, at the end of his Geometry; which is "As the sum of the mercurial columns is to their difference, so is the constant number 52,000 to the approximate height" in feet. This rule is easily remembered, and is not far from the truth; but a more correct result may be obtained by using 52,200 as the 3rd term. At the height of a mile the height thus found differs only nine feet in defect from that obtained by a logarithmic calculation, whereas by Leslie's rule the defect is twenty-nine feet. When the height does not exceed 4,000 feet, 52,200 gives within two feet of the logarithmic calculation. At elevations above a mile, the difference increases rapidly: it then becomes necessary, as Leslie recommends, to subdivide the interval into smaller portions.

The following Table shews the results of the several Rules.

	Approximate Height by		
Barometers.	Logarithms.	52,200.	52,000.
30 and 29.5	438.0	438.7	437.0
... „ 29.0	883.4	884.7	881.3
... „ 28.5	1336.6	1338.0	1333.3
... „ 28.0	1798.0	1800.0	1793.1
... „ 27.5	2267.3	2269.1	2260.4
... „ 27.0	2745.4	2747.4	2736.8
... „ 26.5	3232.5	3233.6	3221.2
... „ 26.0	3728.9	3728.6	3714.3
... „ 25.5	4234.9	4232.4	4216.2
... „ 25.0	4750.9	4745.5	4727.3
... „ 24.0	5814.6	5800.0	5777.8
... „ 23.0	6923.6	6894.3	6867.9
... „ 22.0	8081.9	8030.8	8000.0
... „ 21.0	9294.1	9211.8	9176.5
... „ 20.0	10565.5	10440.0	10400.0

At 3700 feet by using 52,200 we get exactly the same result as by logarithms. Leslie's rule is then in defect about 15 feet.

This rule may be thus expressed in words: "The sum of the barometric columns at the two stations is to their difference, as 52,200 to the approximate height in feet," and algebraically (B and b being the barometers at the 2 stations)

$$\left(\frac{B-b}{B+b}\right) 52200 = \text{Approximate height (A).}$$

On the reduction of mean temperature by elevation, Professor Leslie has given the following formula as the result of his experiments on the cold produced by diminution of barometric pressure. If B and b denote the barometric pressure at the lower and upper stations; then will $\left(\frac{B}{b}-\frac{b}{B}\right)25$ express on the Centigrade scale, the diminution of heat in ascent (B). This formula cannot be universally true, though it is known to give results agreeing very well with observation in moderate elevations. For if we suppose three stations A, B, C, in the same vertical line at which the barometer stands respectively at 30, 20, and 10 inches, it is obvious that the reduction of temperature between A and B together with that between B and C must be the same as the whole reduction from A to C. The formula gives $\left(\frac{30}{20}-\frac{20}{30}\right)$ $25=20.83$ as the diminution from A to B; and $\left(\frac{20}{10}-\frac{10}{20}\right)25=37.5$ as that from B to C: the sum of which is 58.33. But we have also $\left(\frac{30}{10}-\frac{10}{30}\right)$ $25=66.67$ as the reduction from A to C. This differs so much from the former result, that we may without any hesitation conclude that the formula cannot be strictly true. In order that the diminution from A to C may be equal to the sum of the diminutions from A to B and from B to C, it seems necessary to make it proportional to the ratio of the densities, or as the logarithm of $\frac{B}{b}$; that is, as the difference of the logarithms of the barometers at the two stations; and if we assume that Leslie's formula gives results not sensibly differing from the truth, at first, we shall have $115 \log. \frac{B}{b}$ to be marked (C) as the expression for the diminution of temperature on the Centigrade scale, or $207 \log. \frac{B}{b}$ to be marked (D) on Fahrenheit, which will give *consistent* results in all cases.* The diminution of temperature is thus proportional to the approximate height in barometric calculations, and if we calculate the approximate height corresponding to a reduction of 1 degree in temperature, we shall have 521.738 feet for 1° cent. and 289.86 feet for 1° Fahr., or in round numbers 522 for 1° cent. and 290 for 1° Fahr. at the temperature of freezing. The numbers 522 and 290 will require a correction for mean temperature, as in barometric measurements: This may be done very simply. The expansion on a column of air of 522 feet for 1° cent. is just about 2 feet, and on 290 feet for 1° Fahr. the expansion is 6 feet very nearly. Hence the corrected numbers may be found as follows: To 522 add twice the number expressing the mean temperature in degrees cent., and we have the correct height corresponding to a difference of 1° cent. and on Fahr. multiply the mean temperature above 32 by 0.6 and add it to 290, the sum is the correct height giving a difference of 1° Fahr.

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* If necessary the co-efficient may by corrected so as to agree with observation.

The following Table may be convenient for reference.

Mean Temp. Cent.	Height for 1°.	Mean Temp. Fahr.	Height for 1°.
0	522	30	289
5	532	32	290
10	542	40	295
15	552	50	301
20	562	60	307
25	572	70	313
30	582	80	319

I may perhaps have occasion to refer again to this subject.

There is a formula for finding the approximate height in barometric operations of the same general form as that of Leslie, for diminution of temperature. The formula is $\left(\frac{B}{b}-\frac{b}{B}\right)$ 13050=Approx. Ht.* (E) The co-efficient in this formula is half the height of the equiponderant column. The co-efficient of formula (A) before given is 52,200, being *double* the height of the equiponderant column, or just 4 times the co-efficient of formula (E). Now as in Leslie's formula the co-efficient is 25 cent. or just $\frac{1}{4}$ of the interval from freezing to boiling, we may therefore transform it into another of the form (A) and it becomes $\left(\frac{B-b}{B+b}\right)$ 100=diminution in degrees cent. or $\left(\frac{B-b}{B+b}\right)$ 180= diminution in deg. Fahr. which may be thus expressed: "The sum of the barometers at the two stations is to their differences, as the No. of degrees in the interval from boiling to freezing is to the diminution of mean temperature by ascent." This rule will give results not sensibly differing from those of the logarithmic formula (C and D) at intervals of 4000 feet, or even at a mile.

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* The formula, $\left(\frac{B}{b}-\frac{b}{B}\right)$ 13,000 and $\left(\frac{B-b}{B+b}\right)$52,200, for the approximate height, are only close approximations to the truth, and are not absolutely identical: the former errs in excess, and the latter a little in defect. If they were absolutely identical, we should have $\frac{B}{b}-\frac{b}{B}=4\,\frac{B-b}{B+b}$, or $\frac{B-b}{B+b}=\frac{B^2-b^2}{4Bb}=\frac{(B+b)(B-b)}{4Bb}$, from which by transposition and division we get $4\,B\,b=(B+b)^2=B^2+2Bb+b^2$ hence $2\,Bb=B^2+b^2$, which however do not differ much from the truth when B and b are nearly equal.

Catalogue of Nepâlese Birds presented to the Asiatic Society, duly named and classified by the Donor, Mr. HODGSON, [*and revised by the Society's Curator*].*

1. [*Spizaëtus* (Vieillot, as recognised by Messrs. Jardine and Selby, *Ill. Orn.* pl. LXVI) *grandis* :†] *Nisaëtus grandis*, Hodgson, [*J. A. S.* V, 230;] (aberrant species:) [*Nisaëtus niveus* ? Jerdon, 'Madras Journal,' No. XXIV, 69,‡ (as identified from a specimen presented to the Society by that gentleman;) but not *Falco niveus*, Temminck, which is *Nisaëtus Nipalensis*, Hodgson, *J. A. S.* V, 229, and apparently also the *F. caligatus*, Raffles, *Lin. Trans.* XIII, 278, wherein the statement that it measures "more than three feet across the wings" would seem to be a misprint for five feet: the latter species, *i. e. niveus* (aut potiûs *caligatus*?) is not uncommon in Lower Bengal, adults having the under-parts very handsomely streaked with deep brown or brownish-black, of which but slight or sometimes no traces occur in the young; one adult female which I have obtained, that was paired with a mate of the ordinary colour, being wholly dusky-black, with an ashy tinge on the upper-parts; its brilliant golden irides contrasting finely with the blackish hue of the plumage.

The *Sp. grandis* varies much in colouring according to age, and somewhat even at the same age; wherefore, as Mr. Hodgson's description of this fine species was drawn up from a single specimen, being the only one that he had then obtained, it is quite necessary to describe it anew, in its different phases.

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* *Vide* XI, 778.—It was the wish of Mr. Hodgson that this Catalogue should have been published immediately, but this could only have been done in a very crude and imperfect manner, and the delay is more than compensated by the suppression of a host of unpublished synonyms, which would otherwise have required to be subsequently reduced. I have also had to find up the various scattered descriptions by Mr. Hodgson, and to collate the synonymy of many of the species, besides drawing up descriptions of several new species, —altogether no inconsiderable labour. Moreover, the delay has enabled Mr. Hodgson to improve the nomenclature considerably, both as regards the institution of some necessary new genera, and the specific appellations of certain of the new species.—E. B.

† Since writing the above, I have strongly inclined to the opinion that this is the *Aquila Bonelli*, of which I have no good description to refer to. *A. Bonelli* is included in Mr. Vigue's list of birds procured in Kashmir and little Tibet, *P. Z. S.* 1841, p. 6, the present species, besides being quite crestless, has the cere of an *Aquila*, and not of a *Spizaëtus*; but its irides are bright yellow, as in the latter group, and the general form also inclines more to the latter.

‡ *Vide* also Elliot, in No. XXV, p. 234, of the same publication.

Length of an adult male twenty-seven inches, by sixty inches in spread of wing (Hodgson); of a female, eighteen inches (Elliot). The closed wing, in a series of seven specimens before me, varies from seventeen inches and a half to twenty inches and a quarter, and the tail from eleven inches to twelve inches and a half; but the greater number approach to the respective former of these dimensions: from point of upper mandible to gape measures about two inches, more or less; tarse about three inches and a half: the talons large and formidable.

This bird approaches somewhat in form to the true *Aquilæ*, and is distinguished from its congeners by the absence of all trace of the usual occipital crest. Adults deep aquiline-brown above, the somewhat lanceolated feathers about the nape laterally margined with whitish, or, in some, with pale brown: tail more or less greyish, and crossed with about seven narrow dark bars, in addition to the subterminal one which varies much in breadth: under-parts pure white, with a narrow dark brown mesial streak to each feather; the tibial plumes chiefly deep brown, freckled with whitish; and the under-coverts of the wings dark brown. Bill plumbeous, its tip and the talons black; cere and toes pale waxy-yellow; irides bright yellow. The mesial stripes on the feathers of the under-parts incline to be broader in the female, and are more developed on the belly, where in some the dark brown colour predominates, spreading in bars over the feathers; under tail-coverts also more or less distinctly banded: some specimens shew the white bases of the feathers very conspicuously about the nape: the inner webs of the tail-feathers are prettily mottled, more especially in adults, as also those of the primaries anterior to their emargination; underneath, the tail is albescent, and its bars are more or less obliterated, with the exception of the terminal one when broad. The young have the lower parts deeply stained with ferruginous (more or less so), and the mesial stripes to the feathers narrow and inconspicuous, scarcely occupying more than their shafts; tibial plumes the same, though in some there are traces of the marking on those of the adult; and the fore-part of the under-surface of the wing is also similar, or nearly so, having at most a dark patch on the under-coverts of the primaries: above, the general cast of colour is merely paler than in the adult, the deeper hue of the latter being confined to near the tip of each feather and along the shaft, whereas in adults it spreads nearly to the edge: and the tail appears more closely barred, with blackish or deep brown upon a pale ground-hue.

The Crestless Eagle-hawk (as this species may be appropriately termed) appears to be generally, though sparingly, diffused over the wooded districts of the mountainous parts of India, while on the Himalaya it would seem to be not unfrequent. It hunts more on the wing than its congeners, in conformity with its structural approximation to the true Eagles. Mr. Jerdon observes, that it is certainly a rare bird in Southern India; and Mr. Elliot, that it "is the noblest of the Indian Eagles, being seldom seen, and then generally at a great height in the air, in wild and savage places. It preys on the Hare — I once saw a pair of them hunting in company, which nearly surprised a Peacock, pouncing on him on the ground." This gentleman remarked its distinctness from the *Falco niveus* of Temminck, to which Mr. Jerdon dubiously referred it. The latter does not hitherto appear to have been met with in Southern India, though tolerably common in Bengal, and also in Nepâl.

2. [*Hæmatornis undulatus,* Vigors, *P. Z. S.* 1831, p. 170; Gould's *Century,* pl. I.] *Circäetus Nipalensis,* Hodgson [*As. Res.* XVIII, pt. II, p. 17 (published 1833)], this bird being clearly a *Circaëtus.* [*Falco bido (?),* Horsfield, *Lin. Trans.* XIII, 137 (1821!): *Buteo bacha (?),* apud Franklin, *P. Z. S.,* 1831, p. 114; and *Hæmatornis bacha (?),* Sykes, *Ibid.* 1832, p. 79. When this species was characterized by Mr. Vigors, "the three species of the group (*Hæmatornis,* Vigors,) were exhibited; their general similarity in colour and markings pointed out; and their specific differences explained. These consist chiefly in size; the *H. holospilus*" (*P. Z. S.* 1831, p. 96, from Manilla,) "being one third smaller than" (the African) "*H. bacha;* while *H. undulatus* considerably exceeds the latter. The first is spotted all over the body, the second only on the abdomen; while the third is marked by spots on the wing-coverts, and by *ocelli* bearing an undulated appearance on the abdomen, the breast also being crossed by

undulating *fasciæ*." A common species in Bengal, as in India generally.]

3. *Pandion* [*haliaëtus:* diffused in suitable situations throughout India.

4. *Icthyaëtus Horsfieldi: Falco icthyaëtus*, Horsfield:] *Haliaëtus plumbeus*, Hodgson [mentioned in *J. A. S.* VI, 367. Not uncommon in Bengal. The spotted first plumage of this bird much resembles the corresponding garb of the common Indian Kite (*Milvus cheela*); and in its next dress the basal portion of the tail is brown, more or less barred above.

A second species presenting the same characters is the *I. nanus*, Nobis, *J. A. S.* XI, 202. It is distinguished by its very inferior size, the closed wing measuring but fourteen inches in length. The only specimen I have seen was received from Singapore, being clad in worn nestling plumage, whereof the terminal pale spots had almost disappeared; and there is a considerable admixture of white on the new feathers growing on the under-parts, forming central streaks on the plumage of the abdomen. The fully adult garb would probably much resemble that of the preceding species. It appears to me that the term *Icthyaëtus* should be restricted to these birds with smooth talons, like those of an Osprey; and that the *Icthyaëtus leucogaster* of Gould's magnificent 'Birds of Australia' (the *Falco leucogaster*, Latham), which scarcely, if at all, differs from the Indian *Haliaëtus blagrus* except in its much superior size, should be retained in *Haliaëtus*, wherein Mr. Gould had already classed the young as *H. sphenurus* *P. Z. S.* 1837, p. 138), as I formerly arranged a specimen of *H. blagrus* (in second plumage), by the appellation *Icthyaëtus cultrunguis*, *J. A. S.* XI, 110.

The truth is, that after *Haliaëtus* has been dismembered by the detachment of *Icthyaëtus*, Lafresnoy, there still remain three marked natural divisions of the genus, which are as follow:—

A. The typical form, as exemplified by the European *albicilla* and North American *leucocephalus*, and to which the Indian *H. Macei* and some others likewise appertain. This last mentioned bird is the *H. albipes*, Hodgson, *J. A. S.* V, 228; and the young in first plumage is the *H. lineatus*, Gray, and in second plumage the *H. unicolor*, Gray, of Hardwicke's Illustrations.

B. The wedge-tailed group, exemplified by *H. leucogaster* and *H. blagrus;* referred by Gould and since by myself to *Icthyaëtus*, but, as I now think, erroneously.

C. The diminutive group with comparatively feeble talons, exemplified by *H. Pondicerianus* (the *Brahminee Cheele* or *Sunkur Cheele* of India), and the Australian *H. leucosternus*, Gould, *P. Z. S.* 1837, p. 138. To this division Mr. Gould has since applied the term *Haliastur*.

Ornithologists in this country should seek to obtain the *Icthyaëtus nanus*, which most probably will be found to occur.

5. *Spizaëtus pulcher;*] *Nisaëtus pulcher*, Hodgson, [mentioned in *J. A. S.* VI, 361, and now regarded by him as typical of that group. It devolves on me to furnish a description of this showy species, which may readily be distinguished from its congeners by its longer and handsomely banded tail, whereon are five dark bars, as broad as or broader than the interspaces of pale ground-tint, whereas in the other species the dark caudal bars are much narrower than the intervening spaces. The occipital crest is fully developed, measuring four inches in length. Plumage of the upper-parts deep aquiline-brown, very dark on the interscapularies, and verging upon black on the crown and occipital crest, which is slightly tipped with whitish; nuchal feathers conspicuously margined with tawny-brown, and their pale basal colour more or less shewing about the nape: under-parts whitish, more or less deeply tinged with fulvous, and marked on the breast with longitudinal broad mesial dark streaks to the feathers; the chin is blackish, continued as a median line to the breast, and two similar lateral streaks, at first very broad, proceed from the corners of the gape; belly and flanks more or less distinctly banded with brown and white, the latter narrower, and the brown darker towards the white, — the belly especially having a confusedly mottled appearance, and the under tail-coverts are similar; the lengthened tibial plumes are more distinctly banded, and the tarsal less so, becoming whitish towards the toes: tail as described, having five broad dark bands, with interspaces of a mottled light brown, becoming greyish with age; its larger upper coverts also banded brown and white, the latter narrower: primaries and secondaries dark brown, banded with blackish; their under surface and that of the tail albescent, with the bars anterior to the emargination of the primaries, and those of the outermost tail-feathers, semi-obsolete.

Length twenty-nine to above thirty-two inches, of which the tail measures thirteen to fourteen inches and a half; wing eighteen to nineteen inches; tarse four inches and a half, and in one specimen before me very densely feathered, in another much less densely. Bill two inches from point to gape, in a straight line: the talons large and powerful. Both these specimens are evidently adults, and probably male and female.

Three Indian species of this group have now been noticed; viz. *grandis*, *niveus* (aut *caligatus ?*), and *pulcher;* and there remain the following: *Sp. cristatellus* (Tem.), Jardine and Selby. *Ill. Orn.* pl. LXVI; Elliot, in *Madras Jl.*, No. XXV, 234; ——*Sp. Kienerii; Astur Kienerii, Magasin de Zoologie*, Guérin, 1837, pl. 35; *Sp. albogularis*, Tickell (Nobis), *J. A. S.* XI, 456, —— *pallidus*, mentioned only by Mr. Hodgson in *J. A. S.* VI, 361, which I do not know; — and *rufitinctus*, McClelland and Horsfield, *P. Z. S.* 1839, p. 153, which would scarcely seem to belong strictly to this genus.*]

6. *Limnaëtus* [*unicolor*, Vigors; *Falco limnaëtus*, Horsfield; *F. unicolor*, Temminck; *Morphnus hastatus (?)*, Lesson, *Zoologie du*

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* Since the above was written, the Society has received two fine specimens of a member of this genus, which, from Mr. Elliot's description, I am disposed to refer to *Sp. cristatellus*. Length about twenty-six inches, of wing from bend sixteen inches, and tail twelve inches; bill, from point to gape, an inch and three-quarters; and tarse four inches and a half anteriorly; occipital crest four inches. Colour of the upper-parts light fulvescent-brown towards the edges of the feathers, their central portion dark aquiline brown, which latter is confined to a mesial streak on the feathers of the nape; prolonged occipital crest dull black: under-parts white at base, and for the greater portion of each feather, their terminal part having a mesial dusky streak, edged with light brown; a dusky streak more or less developed from each corner of the lower mandible, and a central one on the throat well developed in one specimen, indistinctly so on the other; a brownish bar across the abdomen more or less distinct; and posterior to this the abdominal feathers and lower tail-coverts are banded with light fulvous-brown, and broadly tipped with the same, the tibial and short tarsal plumes being similarly coloured: volar feathers of the wings dusky externally, their inner webs brown with dusky bars, and the pale portion passing into white internally, anterior to the emargination of the primaries; underneath the volar plumes are white anterior to their emargination, and barred with dusky beyond it; the fore-part of the under surface of the wing being also white, mottled with dusky-brown, and the axillaries and sides marked with rufescent-brown: tail also brown above, with five dusky bands on the older specimen, the basal one indistinct, and the last or subterminal band broadest; in the other marked with six dark bands, and the rudiment of a seventh at base; underneath albescent, the dark bands partially obsolete. This species is not improbably Mr. Hodgson's *pallidus;* and can only doubtfully, I think, be referred to that figured by Messrs. Jardine and Selby.

Voyage de M. Bélanger, p. 217. A second species of this division exists in the *L.* (olim *Buteo*) *punctatus*, Jerdon, *Supplement.*]

7. *Falco* [*shaheen*, Jerdon, *Madr. Jl.* No. XXIV, 81.]

8. *Pernis* [*Ellioti*, apud Jerdon, to whom the specimens were transmitted for examination. I must confess, however, that I am by no means satisfied of the distinctions pointed out between this and the *P. cristata*, Cuvier, vel *Falco ptilorhynchus*, Tem.; specimens of both being before me so labelled by Mr. Jerdon; and one of the latter minutely agrees with the description of *P. maculosa*, Lesson, in the *Zoologie du Voyage de M. Bélanger*, except in possessing a distinct crest. Now I am unaware that any good distinction has hitherto been remarked between the *P. cristata* and *P. apivora*, further than that the European bird is never crested, both being alike variable in plumage; and I see that the latter is enumerated among Dr. Royle's birds procured at Saharunpore. In reference to the value of the character derivable from the presence of a crest, it may be remarked that Mr. Hodgson describes a variety of *Spizaëtus niveus* (his *Nisaëtus Nipalensis*, *J. A. S.* V, 229), having "a drooping Egret-like crest of two long, narrow, composed plumes"; whereas in general, and in all cases observed by me, this species has merely a very slight indication of such a crest at any age. Nevertheless, the prevalence of the crest in Indian Perns, and its invariable absence in those of Europe, are sufficiently remarkable; and probably indicate an aboriginal distinctness of species, though perhaps sufficiently allied to breed and merge together where they inhabit the same localities. M. Lesson also speaks of a *P. torquata*, *P. ruficollis*, and a *P. albogularis*, referring to his *Traité d'Ornithologie;* but if reposing only on differences of colour, I should be very slow to accept such diversities as specific].

9. *Milvinæ.* Genus [*Haliastur*, Gould.] *Haliaëtus!! Pondicerianus*, Auct. type. [*Milvus Pondicerianus*, apud Jerdon.] Leads from Eagles to Buzzards. [It is curious to remark the difference of opinion expressed with regard to the systematic position of this well known species. Thus Mr. Hodgson writes:— "Those who have classed the *Brahminee Cheel* of India with the fishing Eagles, may be safely said to know as little of the structure, as of the habits, of that paltry *Milvine* bird," &c. (*J. A. S.* VI, 368.) And Mr. Jerdon "nearly agrees" with him in opinion; even ranging it, as we have seen, in

Milvus (*Madr. Jl.* No. XXIV, 72.) Dr. Jameson, on the other hand, avers that "no person who has ever studied this bird in its native haunts on the Hoogly or the Ganges, where it occurs in vast numbers, in company with other *Haliaëti* (!), would for a moment doubt where its proper position ought to be in the Ornithological system." (*Calc. Journ. Nat. Hist.* No. III, 318.) Mr. Gould, again, on referring a new Australian species to *Haliaëtus* (*P. Z. S.* 1837, p. 138), remarks that it is "nearly allied to *Hal. Pondicerianus*," thus doubly acknowledging the current arrangement of the latter, though he has since formed a particular section for these two species. For my own part, I have long regarded the true *Milvi* as being closely related by affinity to the *Haliaëti* or Ernes, and therefore find no difficulty in agreeing with Messrs. Hodgson and Jerdon as regards the proximity of the *Brahminee Cheel* to the Kites, while I still prefer to retain it as a subgenus of *Haliaëtus*, of which group I have already indicated three marked natural divisions, the present bird being characteristic of one of them.

10. *Astur* (?) *Dussumieri:* at least this species appears closely allied to two Australian Hawks (*approximans* and *cruentus*) recently referred to this genus by Mr. Gould, having the toes very much shorter than in restricted *Accipiter**; but it would be better perhaps to institute a separate division for this intermediate form : *Accipiter Dukhunensis*, Sykes ; and] *A. scutarius*, Hodgson, [Bengal Sporting Magazine, for 1836, p. 180; the young: noticed also in *As. Res.* XIX, note to p. 175, together with an *A. affinis* which, from the context, I much suspect is merely the adult.† N. B. Mr. Jerdon agrees with me in referring the specimens marked *scutarius* by Mr. Hodgson to the young *A. Dussumieri.*]

11. *Buteo canescens*, Hodgson, ('Bengal Sporting Magazine' for 1836, p. 180.) As few naturalists, but especially foreign naturalists, have the opportunity of consulting the work referred to, I deem it proper to quote the description, and shall offer some further remarks on the species.

It is a perfectly typical Buzzard, nearly allied to the European *B.*

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* Vide *P. Z. S.* 1837, p. 98.

† The *Noctua Tarayensis* there mentioned is *Athene brama*, or *N. Indica*, Franklin; and the *N. tubiger* identical with *N. Brodiei*, Burton, *P. Z. S.* 1835, p. 152.

vulgaris. "Mature female twenty-three to twenty-four inches long, by fifty-four to fifty-six inches in extent of wings, and three lbs. and three-quarters in weight:" wing from bend sixteen inches and three-quarters to eighteen inches and a quarter, and tail ten to eleven inches: point of upper mandible to gape one inch and seven-eighths; and tarse three inches and a quarter, being plumed for the upper inch and a half. The male is considerably smaller, with wings fourteen and three-quarters to sixteen inches, and tail nine inches and a half to ten and a half.

The following is Mr. Hodgson's description of the plumage: "Female: — head, neck, and body below, white; dashed here and there with beauteous buff, and streaked narrowly and lengthwise on the cap and thighs with brown: tail, whitey-brown, with four to six narrow bars towards the end: back and wing-coverts, medial brown, the larger picked out with rufous: quills immaculate externally, and the great ones darker or black-brown; all the quills blanched internally except near their tips; but the primaries, immaculate; the rest, and especially the secondaries, shewing six brown bars across the inner vanes of the plumes: legs and cere dirty-yellow; bill blue, its hook and the talons black: iris hoary.

"Male smaller and less blanched. Young greatly more coloured than the mature female; above and the thighs saturate-brown, edged with rufous; below sordidly rufescent, or luteous, with large longitudinal dashes of brownish-red, changing to herring-bones on the thighs: tail brown, with deeper cross-bands prevailing throughout, and amounting to ten in number: iris brown; legs and cere, greenish."

From a series of specimens before me, however, it is quite clear that the brightly rufous-edged specimens are adults, while the young have but little trace of this colour, which is more or less confined to the scapularies and wing-coverts, and is besides comparatively very faint and pale; and that such *are* the young is demonstrated, not only by the less acuminate form of the nuchal plumes, but from the fact that one of them was killed while beginning to moult, and shews a few of the new bright rufous-edged feathers among its scapularies, which contrast strongly with the dull hair-brown colour of the rest of the upper-parts. A particularly fine female, received from Mr. Hodgson, may be described as having the dorsal plumage and smaller wing-feathers slightly empurpled dusky, laterally somewhat broadly margined with bright rufous, which fades considerably as the feathers become old; head dull rufescent-brown, margined paler, with a vague whitish streak over the eyes, enlarging beyond them; feathers of the nape pointed and slender, white at base, with dusky terminal thirds edged laterally with rufous; those of the sides of the neck rufescent with dusky shafts, and edged laterally with whitish or hoary; throat white, with narrow dusky shafts, and the rest of the under-parts fulvous-white, with mottled dusky-and-rufous blotches on the feathers, inclining to form a sort of gorget on the breast, and always presenting a broad dark abdominal band, more or less developed (as in *B. lagopus*): lengthened tibial plumes dusky, tipped with dark rufous, or in some specimens of the latter hue, with merely dusky shafts: tertiaries and greater wing-coverts hair-brown, the former more or less distinctly barred on their inner webs, upon a whitish ground in some; the tips of the primaries and secondaries empurpled dusky, and the outer webs of the exterior primaries greyish to near the end; underneath, the wings display a very large white patch, constituted chiefly by the inner vanes of the primaries as far as their emargination, and the fore-part of the wing is dusky, broadly edged with rufous, of which colour are also the axillaries: tail rather faint rufous, with a nearly obsolete subterminal dark bar, its basal portion, and the exterior webs of all the outer feathers, dashed with cinereous. Other specimens have merely narrow mesial streaks of rufous, with dusky shafts, to most of the feathers of the under-parts, and the abdominal band paler and chiefly rufous; tail with little or no ashy tinge, indicating that such are less advanced in age. The immature plumage is of a generally more dingy cast, with no rufous below, even on the tibial plumes; the dorsal feathers are scarcely, when at all, margined with faint rufous; and the primaries and tail are minutely mottled and numerously banded: but these also vary in the amount of developement of their markings, both as regards the extent and depth of colouring.

According to Mr. Hodgson — "These birds are very common in the central and northern hilly regions of Nepâl; but I never," he remarks, "procured one from below. The species appears to be an oriental analogue of *B. vulgaris.* It adheres to the woods when the crops are up; but, after harvest, comes into the open country, and is perpetually seen in the fields perched on a clod, and looking out for Snakes, which constitute its chief food. It also preys on Rats and Mice, and on Quails, Snipes, and Partridges; but is reduced to take the *birds* on the ground. I have seen it, however, make a splendid stoop at a Quail, which, after being flushed, chanced to alight on a bare spot, so as to be visible to the bird as he followed it with his eye on the wing and marked it settle. Teal and even Ducks are frequently slain by our bird in the same way. If he can perceive them take wing, even at half a mile's distance, he is up with them in an instant, and is sure to capture them, unless they are under cover in a moment after they touch the earth. I have carefully compared specimens of *vulgaris* and *canescens*, and cannot help thinking that the species are distinct; the breadth of the head and of the bill near it being so much more striking in the latter than in the former. Authors suppose that *Buteo vulgaris* is never found east of the Cape. Our bird is its representative."

Its representative no doubt on the Himalaya, but in Southern India there are two true Buzzards, the *B. longipes* and *B. rufiventer*, Jerdon, and in the Tenasserim provinces another, *B. pygmæus*, Nobis.]

12. *Elanus melanopterus:* [*Petite Buse Criarde* of Sonnerat, upon which are founded *Falco vociferus*, Latham, and *F. clamosus*, Shaw.]

13. *Accipiter* [*nisosimilis*, Tickell, *J. A. S.* II, 571*: A. nisus* vel *fringillarius* of Jerdon and others. It differs from the European species in its larger size, and in having constantly a long superciliary white line; the markings of the under-parts are also somewhat different.

14. *Milvus* [*cheela*; *Falco cheela*, Gmelin: *M. govinda*, Sykes; *M. ætolius*, Lesson. *N. B.* I thought at first that the specimens sent of this bird presented certain differences from the common Indian Kite, but subsequent comparison of them with numerous examples of the latter has convinced me of their identity.]

15. *Falco peregrinus:* [*F. calidus*, Latham.]

16. *Falco* [*juggur*, Hardwicke and Gray; *F. luggur*, Jerdon] (*Lagger*, *Jhagger*, Indicè, *Maset*, fœm.)

17. *Falco tinnunculus.*

18. *Buteoninæ.* Genus *Butastur*, Hodgson. *Buteo teesa*, Auct., type. [*Circus teesa*, Franklin; *Astur Hyder*, Sykes.] It differs from the true

Buzzards in its less corpulent form, and general adaptation for more active habits: the tarsi are longer and more prominently scutellated in front, the toes also being scutellated above nearly to their base, and the talons are comparatively powerful. The markings also are somewhat peculiar, and recal to mind those of various South American *Raptores;* but still manifest a relationship to the true Buzzards, which is further conspicuously shewn by the rufous tail.

19. *Falconinæ.* Genus *Hyptiopus* (Hodgson, olim *Baza, H.* [*lophotes; Falco lophotes,* Temminck: *Lophotes Indicus,* Lesson; *Buteo cristatus,* Vieillot; *Colvy Falcon* of Latham; *Falco Lathami,* J. E. Gray, and since *Lepidogenys Lathami.* G. R. Gray; *Baza syama,* Hodgson, *J. A. S.* V, 777, which latter generic name has precedence of *Lepidogenys,* while *Lophotes* is pre-occupied in Ichthyology. Moreover, I do not consider this form to appertain to the Falcon group, but decidedly to that of the Perns and Elans.] Type.

20. *Falco chicquera.*

21. *Ierax* [*Bengalensis: Little Black and Orange-coloured Hawk* of Edwards, erroneously regarded as the female of *I. cœrulescens* by various authors. Vide p. 180,* *ante.*

22. *Ketupa Leschenaultii,* Lesson: *Strix Hardwickii,* Gray: *cultrungris nigripes,* Hodgson, *J. A. S.* V. 364, and mentioned in VI, 363. Identical with specimens from Southern India and the Tenasserim provinces.]

23. *Mesomorpha* (Hodgson, olim *Urrua,* H.) [*Bengalensis; Otus Bengalensis,* Franklin, Gould: *Bubo ? caveareus,* Hodgson, *As. Res.* XIX, 169, and since *Urrua cavearea,* H., *J. A. S.* VI, 372; altered to *Mesomorpha,* Ibid. X, 28, where various other prior appellations are similarly changed and classicized; *Urrua Bengalensis,* Jerdon.] Type.

24. *Meseidus* (Hodgson, olim *Bulaca,* H.) *Newarensis* [*Ulula ? Newarensis,* Hodgson, *As. Res.* XIX, 168; *Bulaca—Id. J. A. S.* VI, 372; *B. monticola,* Jerdon, *Supplement.*] Type.

25. *Strix flammea:* [*Str. Javanica,* apud Jerdon.]

26. Genus *Ninox,* Hodgson: type. *N.* [*scutulatus; Strix scutulata,* Raffles, *Lin. Trans.* XIII, pt. II, 280: *Str. hirsuta,* Tem.; *Str. lugubris,* Tickell, *J. A. S.* II, 572; *Ninox Nipalensis,* Hodgson, *Madr. Jl.* No. XIV, 23, with figure; *J. A. S.* VI, 364, where the singular paral-

lelism of proportion manifested by this species and the Hawk *Hyptiopus lophotes* is noticed in minute detail.

27. *Athene cuculoides;*] *Noctua cuculoides,* Vigors and Gould. [This bird* is found in Southern India and in the Tenasserim provinces].

28. *Scops lettia,* Hodgson [*As. Res.* XIX, 176: *Scops Lempiji (?),* Horsfield, vel *Sc. Javanicus,* Lesson, to which an Assamese specimen is referred by Dr. Horsfield. I incline to suspect that the *Sc. Sunia,* Hodgson, Ibid., will prove to be merely the young, as the "Red Owl" of Wilson's 'American Ornithology' is of his "Mottled Owl", *(Sc. Asio).*

29. *Athene radiatus; Strix radiata,* Tickell, *J. A. S.* II, 572; *Athene erythropterus,* Gould, *P. Z. S.,* 1837, p. 136;] *Noctua perlineata,* Hodgson [mentioned in *J. A. S.* VI, 369].

30. *Lophophorus Impeyanus.*

31. *Tragopan satyrus.*

32. *Euplocomus leucomelas.*

33. [*Ithaginis* (Wagler;) *Plectrophorus,* J. E. Gray; *Ptilopachus,* Swanson;] *cruentata.*

34. *Gallophasis* (Hodgson, type,) *pucrasia.* [*Phasianus pucrasia,* Vigors and Gould. This bird certainly does not rank well in any of the divisions hitherto established among the Pheasants. Its distinctive traits consisting in the absence of any nude crimson space around the eyes, in the similarity of the sexes, the peculiar character of the plumage, and the short straight tail; but it approximates the restricted *Phasiani* more than it does any other group, and it is remarkable that the only Indian species of true Pheasant *(Ph. Wallichii* vel *Stacei)* differs from the rest in being crested, though much less heavily than the present bird, which latter is known to sportsmen by the names *Plass, Pucrass,* and *Koklass.*

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* The Society has just been presented with a specimen from Chusan.

Proceedings of the Asiatic Society.

(Wednesday Evening, 12th April, 1843.)

Present.

Sir J. P. Grant, Knight,
Sir W. H. Seton, Knight,
Lieutenant Colonel, W. N. Forbes, C. B.
H. Torrens, Esq.
R. Houstoun, Esq.
Captain A. Broome,
N. B. E. Baillie,
S. G. T. Heatly, Esq., and others.

The Honorable W. W. Bird, President, in the chair.

The President opened the business of the evening by expressing his thanks to the Society for electing him as its President. He observed, that he was one of the oldest, if not the oldest, member in India; that he felt both pride and gratification in the honor conferred upon him, and would use his best exertions to uphold the credit of the Society, which had attained so much celebrity in the estimation of the scientific world. The President observed, that although he could not promise much, individually, to the Society in scientific matters, yet from his position in Society, he was satisfied that he could influence largely valuable contributions. That he had been in some measure successful in this hope, in as much as he had prevailed upon Mr. H. Torrens, the late Honorary Secretary, to continue his labors as such for the Society, aided by a stipendiary Sub-Secretary. This point was not of immaterial importance when the difficulty of procuring men of scientific attainments, and with the other qualifications requisite to fit them for the multifarious duties of Secretary to the Society was considered; and this was feelingly illustrated by the President in the case of their late illustrious Secretary, Mr. J. Prinsep, who sacrificed his life in the ardour of his scientific researches to benefit the Society. The President concluded by referring to a memorandum which had been prepared at his request, for the future conduct of the business of the Society by the Honorary Secretary, and which was read as follows:—

At a Meeting of the Committee of Papers held at Government House, on the 1st April, 1843:—

Present

The Honorable the President.
Sir H. W. Seton, Knight,
Lieutenant Colonel W. N. Forbes, C. B.
Lieutenant A. Broome.
H. Torrens, Esq. Officiating as Secretary to the Committee.

Read the following Memorandum.

Resolved.—That its substance be generally approved, and that it be submitted to the Society at the ordinary Annual Meeting for the appointment of Officers of the Society, to be held on the 12th April.

H. TORRENS,
Officiating as Secy. to the Committee.

The Honorable the President has expressed a wish, that I should lay before him a Memorandum of the course expedient to be taken with reference to the conduct of the business of our Society by an Honorary Secretary.

The Honorable the President desires, that the office of Secretary should continue to be held as an honorary appointment. It is the wish of the Society generally.

But I have explained to him the impossibility of procuring the entire services of any honorary holder of the office, and he has acquiesced in the expediency of engaging a Sub-Secretary to conduct ordinary correspondence with current business, and to assist, under the Secretary, in the editing of the Journal lately my property, which the Society desire to take over, and make their own.

I have now to suggest the mode in which the Sub-Secretary may be remunerated, without inducing extra charge to any serious extent upon the Society. And here let me observe, that I intend submitting to the Society, with the sanction of the Honorable the President, the nomination of Mr. Henry Piddington, our Geological Curator, to the duty. His general acquaintance with the principles of science; his long experience of this country, its usages, and its people; his literary qualifications; his habits of business; and last not least, his well-known zeal for science, his mental powers and his energetic use of them; render him more eligible for the very miscellaneous and peculiar duties which he could be called upon to perform as Sub-Secretary than any person with whom I am acquainted in Calcutta or in India. I have had good reason to know how well he could perform those duties by my experience of the manner in which he has already assisted me in my attempts to perform the work of Secretary.

Having thus premised, I proceed to note my scheme.

1. That there be an Honorary Secretary to the Society, charged either alone, or as associated with other Honorary Secretaries, with the special duty of conducting the department of Oriental Literature.

2. That he be answerable to the Society for the proper disposition of their funds, under the immediate instructions of the President.

3. That he be further answerable to the Society, for the due and proper conduct of

their correspondence, foreign and internal, and that he have the supervision of the publication of the Journal.

4. That he be assisted by a Sub-Secretary, whose duty will be to act under the Secretary for the purposes noted in No. 3, as also for the general charge of the premises, and property of the Society; to check all petty charges and disbursements in the departments of Curator and the Museum, and the Curator of the Museum Economical Geology, before submitting them to the Secretary, and to assist in editing the Journal of the Society under that officer.

5. That he be paid for these services, 200 rupees a month.

And here is the supposed difficulty, the procuring of funds for this salary.

Now the interest of our funded monies—Rupees 13,000, Csoma de Koros' legacy (Rs. 4000) not included; gives about 60 (sixty) rupees a month.

The appointment of a Sub-Secretary will render superfluous that of the Museum Clerk employed under the Librarian on 60 (sixty) rupees a month. The demand from Government of the payment of the contingent charges of the Museum Economic Geology, averaging about 40 (forty) rupees a month will save the Society this sum,* and render it so much available for general purposes.

Thus we should have :—

Interest, ..	60	Rs per Mensem.
Salary saved, ..	60	
Charges saved,	40	
Total Rs.	160	

The residue necessary for the complement of 200 rupees, may be easily spared out of the sum (about 4,000 rupees,) which used to be spent annually by the Society in the purchase of the Journal for their members, and I can safely say, that the expense will be more than trebly covered by the saving which close supervision and better management must induce in the cost and charges of editing the Journal as the property of the Society.

I would have suggested the re-organization of our Accountant's Office and Assignment to the Sub-Secretary of the duties belonging to it, but I cannot recommend that scheme.

The Sub-Secretary should be relieved from all financial responsibility, and be left to devote himself to the active duties of his peculiar position. Mr. **Piddington**, with his other work, will have, as I see he has now, more than ample occupation for all his time in the Sub-Secretariat, the duties of which he is indeed experimentally performing.

Sub-Secretary's Salary.

Interest,	..	..	..	60
Salary saved,	..	..	..	60
Costs ditto,	..	.	..	40
Allowed from Journal,		..	..	40
Total Rs.	..	..	..	200

As the contingent charges of the Museum Economic Geology, may be occasionally under 40 rupees, it might be well to rate our new outlay at 50 rupees a month, for which the Society will secure efficiency of a sterling character in the important duties of their Secretariat.

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* I never sent in this bill to Government, keeping the demand until the Museum Rooms for the institution had been built at the Society's cost and charges, when it might justly be made.

Should the Society, as noted by the Honorable the President, think my services as Honorary Secretary of any value, I willingly offer those, though save as respects some portion of Oriental Literature, they are very worthless. H. TORRENS.

March 24, 1843.

N. B.—Serious and severe illness has delayed the preparation of this paper.

This memorandum having been again read to the meeting was unanimously passed and approved, and Mr. H. Torrens was accordingly appointed Honorary Secretary, and Mr. H. Piddington Sub-Secretary to the Society, under his superintendence, upon a salary of Rs. 200 per month.

Sir L. Peel, Chief Justice, and W. Seton Karr, Esq., proposed at the former meeting were ballotted for, and unanimously elected as members of the Society.

Ordered.—That the usual communication of their election be made to Sir L. Peel and Mr. Karr, and that they be furnished with the rules of the Society for their guidance. The following gentlemen were proposed as Members of the Society:—

Lieut. R. Strachey, B. E. proposed by Lieut. Baird Smith, B. E., seconded by Mr. Piddington.

Capt. Goodwyn, B. E. proposed by Lieut. A. Broome, B. H. A. and seconded by Lieut. Col. Forbes.

The Honorable H. T. Prinsep was also proposed as a Honorary Member by the Honorable the President, seconded by Sir H. Seton.

Library.

The following Books were presented:—

Books received for the Meeting of the Asiatic Society, on the 12th April 1843.

The Calcutta Christian Observer, April, 1843. Presented by the Editor.

The Oriental Christian Spectator. Bombay, February and March 1843. Presented by the Editor.

The Calcutta Literary Gleaner, March and April 1843. Presented by the Editor.

Proceedings of the Academy of Natural Sciences of Philadelphia, 1841-42. vol. I. Nos. 1 to 16, from the Academy.

List of the Members and Correspondents of the Academy of Natural Science of Philadelphia, 1841, from the Academy.

Second Bulletin of the Proceedings of the National Institution for the promotion of Science. Washington 1842. Presented by Dr. Harlan.

Redfield on Whirlwind Storms, with replies to the Objections and Strictures of Dr. Hare. Presented by the Author.

Redfield's Reply to Dr. Hare's further objections relating to Whirlwind Storms. Presented by the Author.

State of New York, in Assembly, January 1840. No. 50, and February 1841, No. 150. Presented by Mr. Morton.

Bernier's Travels, translated from the French by J. Stuart. Calcutta, 1826. Presented by Dr. Boer.

Nicollet's Essay on Meteorological Observations. Presented by Dr. Morton.

Morton's Description of some new species of organic remains of the Cretaceous Group of the United States. Presented by the Author.

Morton's Inquiry into the distinctive characteristics of the Aboriginal race of America. Presented by the Author.

Catalogue of Skulls of Man and the inferior Animals, in the collection of S. G. Morton. Presented by Dr. Morton.

Morton's Memoir of William Maclure, Esq. Presented by the Author.

Morton's Remarks on the so-called Pigmy race of the Valley of the Mississippi. Presented by the Author.

Morton's Some Remarks on the ancient Peruvians. Presented by the Author.

Audubon and Bachman's description of new species of Quadrupeds inhabiting North America. Presented by Mr. Morton.

Wood's Memoir of the Life and Character of the late J. Parrish. Presented by Dr. Morton.

Roger's Third Annual Report on the Geological Survey of the State of Pennsylvania. Presented by Dr. Morton.

Morton's Crania Americana (from the American Journal of the Science and Arts, No. 2. vol. 38. Presented by Dr. Morton.

Say's Descriptions of some new Terrestrial and Fluviatile Shells of North America. Presented by Dr. Morton.

Pinnock and Moore's Report of Experiments on the Action of the Heart. Presented by Dr. Morton.

Report on the strength of materials for Steam Boilers. Presented by Dr. Morton.

Wight's Icones Plantarum Indiæ Orientalis, vol ii. part Iv, from the Government of India.

Morton's Crania Americana, or comparative view of the Skulls of various Aboriginal Nations of North and South America. Philadelphia, 1839. Presented by the Author.

Herapath's Railway and Commercial Journal, January 7th, 1843, vol. v. No. 178.

Read the following papers; viz. Letter No. 502, dated 29th March, 1843, from Mr. Secretary Thomason, transmitting a report by Lieut. J. D. Cunningham, of Engineers, on the province of Kunawar and the adjacent Bhotee districts, for publication in the Society's Journal, should it be deemed fit to do so.

Letter from Lieut. R. Baird Smith, of Engineers, of 25th March, 1843, forwarding for publication in the Journal the first part of a Memoir on Indian Earthquakes.

Letter from Mr. Officiating Secretary Halliday, of 3rd March, 1843, forwarding for presentation to the Society, a volume of Icones Plantarum

India Orientalis, or Figures of Indian Plants, by Surgeon R. Wight, of the Madras Establishment.

Letter from Sam. George Morton, Esq. of Philadelphia, of 4th Aug. 1842, forwarding for presentation to the Society, a copy of his "Crania Americana," and requesting to be furnished with skulls of Hindoos and other oriental nations, to aid him in the pursuit of his comparative investigations, which now embrace all the races of men.

Letter from B. H. Hodgson, Esq. dated 1st instant, communicating that Mr. Howard is about to come forth in the present month with the first division of the Zoology of Nipal (Mammalia), and that he expects half the price of each division of the work, or Rs. 25, to be paid in advance.

Read the following report from the Officiating Secretary:—

1. The Officiating Secretary reports, that having, as was desired, made enquiries as to the expence of raising the whole roof over the stair-case instead of a skylight, he is informed that this would cost at least 800 Rupees: Mr. Bolst, our architect, thinks it very dangerous to undertake, with reference to the state of the architrave beams round three sides of the square and that of the screen wall on the fourth. By taking away the shelves on brackets which support the model of the Taj, and that of the Lama temple, and by opening the doors of the new rooms, bird-room and fossil room below, it has been found that a sufficient light for the objects intended to be placed below the stairs may be obtained. It is therefore thought by Mr. Torrens and himself, that for the present the skylight may be dispensed with

2. It was reported at the January meeting, that Major Troyer had advised the Secretary that the French Government had renewed the allowance of 1500 francs, (650 Rs.) for copying the Veds. Upon a reference to the French Government at Chandernagore, the authorisation which this letter contains has been received, and when the money is brought to account, the Society will debit the French Government with the balance of 233 : 7 : 9 Rs., due from it to the late Mr. J. Prinsep's estate, and which was provisionally paid by the Society. See Proceedings for June 1839.

The arrangements for continuing the copying have been duly made, and the work is in progress.

It would be highly advisable that the Society should determine as to what individuals and Societies the Journal should be sent. The American Societies and some individuals in that country are most attentive in sending us their publications, as also some in France. As will be noted by the accompanying letters, we are much arrear with our American friends. I have obtained a list of our present distributions, which is annexed, and I may mention the Academie Royale de Bordeaux as a public body regularly forwarding to us its transactions, but, as it would appear, not receiving our Journal.

List of the Journal of the Asiatic Society distributed gratis on behalf of the Society, by Messrs. Allen and Co. of London.

Professor Wilson,	1
Asiatic Journal,	1
Royal Society,	1
Royal Asiatic Society,	1
Edinburgh Philosophical Journal,	1
Royal Institution,	1
Philosophical Magazine,	1
Athenæum,	1
Professor Heyne,	1
Baron Von Hammer Purgstall,	1
University of Bonn,	1
Royal Society of Edinburgh,	1
Spectator,	1
Professor Schlegel,	1
	14
Dispatched direct from Calcutta, to Major Troyer, Paris,	10
Sir H. T. De la Beche,	1
Total	25 Copies.

Read the following letters of 12th instant, and lists from Dr. Roer Librarian.

To H. Piddington, Esq. Acting Secretary, Asiatic Society.

Sir,—In continuation of my arrangement of the Antiquities of our Museum, I have the honour of forwarding three lists to you; viz. of the armour, of the musical instruments, and of the models of implements, tools, specimens of manufacture of the natives of India and other Asiatic nations. The arrangement of those articles has now been completed, and it is satisfactory to me to inform you, that the names of the donors and the locations of the greater part of them have been ascertained and duly noted.

I have the honour, to be, Sir,
Your obedient servant,

12th April, 1843. G. Roer.

Models of Implements, Tools, Machines, &c.

1. A Hindustani plough, called Hal. Donor Miss Tytler. As. Res. Vol. xv. App. xxxv.
2. A Hindustani drill plough. Donor ditto ditto.
3. Model of a native plough. Donor G. T. Lushington, Esq.
4. A Javanese plough. Donor Capt. T. Fiddes. As. Res. Vol xiii. App. xvii.
5. Plough used by the Parbuttiahs. Donor Dr. A. Campbell.
6. Instruments for digging and clearing lands of weeds. Donor Miss Tytler, As. Res. Vol. xv. App. xxv.
7. A Hindustani spade, called Phaura. Donor ditto ditto.
8. A spade, called Koo by the Newars, and Kodalli by the Parbuttiahs. Donor Dr. A. Camp-

9. Three Hindustani sickles or Hansuas. Donor Miss Tytler. As. Res. Vol. xv. App. xxv.
10. Henga, an instrument for pressing the seeds into the ground, and breaking clods, like the English roller. Donor Miss Tytler, As. Res. Vol. xv.
11. An instrument, called Kurmaghan by the Newars, used for breaking the clods and pressing the soil. Donor Dr. A. Campbell.
12. Roochi-mughan, used to cover sown wheat and gogha, or Upland rice. Donor ditto ditto.
13. Chassa-mughan, used to smooth the flooded beds, in which the seeds and taki are sown, and also to prepare the soil for sowing vegetables, pepper, (red) ginger, &c. Donor ditto ditto.
14. Poo-retcha, used for weeding the dry rice. Donor ditto ditto.
15. Chong-kuki, used for weeding the dry rice. Donor ditto ditto.
16. Rúé, used for spreading grain and collecting it in heaps after its removal from the straw. Donor ditto ditto.
17. Rúti, used for making chawl, (rice) from dhan and for pounding bricks. Donor ditto ditto.
18. Chon-rumna. Donor ditto ditto.
19. A dhunki, or chalni, used for separating grain from the husk. Donor Miss Tytler. As. Res. Vol. xv.
20. Another, ditto ditto.
21. Ukhli-músel, or pestle and mortar for separating grain from the husk. Donor ditto ditto.
22. Dhenki, used for ditto ditto. Donor ditto ditto.
23. Ooghan-okua, used by the Parbuttiahs for ditto ditto. Donor Dr. A. Campbell.
24. Sup, used for winnowing corn. Donor Miss Tytler. As. Res. xv.
25. A model, shewing the manner in which the oxen tread out the corn. Donor ditto ditto
26. A mill for grinding corn, called by the natives janta-chakhi. Donor ditto ditto.
27. Another ditto ditto.
28. Model of a grinding stone. Donor ditto ditto.
29 A kolhu, or Hindustani oil mill. Donor ditto ditto.
30. An oil press, called Chikon-sa. Donor Dr. A. Campbell.
31. Model of the native mill for grinding mustard-seed. Donor G. T. Lushington, Esq. As. Journal, iv. p. 56.
32. A sugarcane-mill or press, called Tura by the Newars, and Rula by the Parbuttiahs. Donor Dr. A. Campbell.
33. A water-mill, called Pan-Chaki on the Northern Doab and Western hills, and Kan by the Newars. Donor ditto ditto.
34. Model of a still for distilling spirits, made of the original materials. Donor Miss Tytler. As. Res. Vol. xv.
35. Model of a still for distilling rose water, made of the original materials. Donor ditto ditto.
36. Múli, a machine for raising water from the well. Donor ditto ditto.
37. Mut, used in Hindustan for raising water. Donor ditto ditto.
38. A machine for raising water. Donor ditto ditto.
39. A bambú basket with which the natives of India water the rice fields. Donor ditto ditto.
40. Koring, a Persian wheel for watering land from a tank or ditch. Donor ditto ditto.
41. Cherkhi, used for separating the seeds from the cotton wool. Donor ditto ditto.
42. A ditto ditto.
43. Dhunki, an instrument in two pieces for beating cotton after the seeds have been separated. Donor ditto ditto.
44. Kaman, a bow with which the spinner beats cotton. Donor ditto ditto
45. Cherkha, spinning wheel of India. Donor ditto ditto.
46. Model of the native spinning wheel. Donor G. T. Lushington, Esq. As. Journ. vol iv. p. 56.
47. A Weaver's Loom, with a weaver, holding a shuttle in his hand. Donor Miss Tytler. As. Res. vol. xv.
48. Model of an instrument, shewing the first stage of preparation for the loom. Donor ditto. ditto.

49. Ditto ditto, shewing the second stage.
50. Reel, in which the skeins of thread are put. Donor ditto ditto.
51. Pareta, or reel of India. Donor ditto ditto.
52. Model of a Loom for weaving bobbin and tape.
53. Ditto ditto, for weaving Hindustani woollen carpets.
54. Ditto ditto, for cotton carpets, called satrinjé.
55. Another ditto ditto.
56. Ditto, for preparing chicks.
57. Ditto ditto, jhalar.
58. Part of the Floor of a House, where golden thread is prepared.
59. An Apparatus for drawing golden thread.
60. A ditto silver thread.
61. A Loom for weaving coarse canvas. Donor ditto ditto.
62. A ditto ditto.
63. A ditto for weaving blankets. Donor ditto ditto.
64. Model to make embroidered cloth. Donor ditto ditto.
65. A Machine for preparing single threads from the leaves of the sirkhi grass. Donor ditto ditto
66. A bundle of Hemp Cords. Donor ditto ditto.
67. Daéra, instrument for spinning hemp. Donor ditto ditto.
68-69. Two Instruments to twist thread. Donor ditto ditto.
70. An Apparatus, used in Hindustan for making butter. Donor ditto ditto.
71. Model of a Saw, used by the natives of Hindustan. Donor ditto ditto.
72. Ditto of an Instrument for drawing circles on the ground with carpenter's hatchets and saw. Donor ditto ditto.
73-92. A variety of Tools and Instruments.
93. A small Harpoon. Donor R. Home, Esq As Res. xii.
91-97. Various Tools.
98. A Chak or Potter's Wheel. Donor Miss Tytler.
99. Model of a Potter's Instrument for preparing earthen pots Donor ditto ditto.
100. Model of a Blacksmith's Forge and Bellows, with two anvils. Donor ditto ditto.
101. Model of a steel-yard. Donor ditto ditto.
102. Model of the steel-yard, used by the natives for weighing, (called túlah.) Donor Raja Kali Kishen Bahadur.
103. Model of an Apparatus, for catching birds. Donor Miss Tytler.
104. Ditto of a Frame, for making tallow candles. Donor ditto ditto.
105. Ditto of an Apparatus, for making paper. Donor ditto ditto.
106-110. Five wooden Stereotypes from Tibet.
111-133. Twenty-three Models of Kitchen Utensils of Hindustan.
134. A native cart. Donor Miss Tytler, As. Res. Vol xv.
135. A bullock cart, for conveying gram. Donor G. T. Lushington, Esq.
136. A Girth, for a bullock.
137. Ruth, native carriage drawn by bullocks. Donor G. T. Lushington, Esq.
138. Ekha-garee, carriage drawn by one horse. Donor Miss Tytler.
139 Ruth, drawn by two horses. Donor G. T. Lushington, Esq.
140. Sagur-garee. Ditto ditto.
141. A Carriage, for females. Donor Miss Tytler.

B. Specimens of Manufacture.

a. OF CLOTH.

142. Specimen of Erria cloth (once washed.) Donor Dr. R. Tytler.
143. Specimens of Erria cloth. Donor ditto ditto.

144. Toos, a sort of coarse cloth, (unwashed.) Donor ditto ditto
145. Toos, white cloth (20-22 Rs. per Than of 27 by 1 yard.) Donor ditto ditto.
146. Mulida, dark-red cloth. (5 Rs. per Than of 7½ yards, broad 1 yard.) Donor ditto ditto,
147. Mulida, blue, (5 Rs. a Than.) Donor ditto ditto.
148. Nimbee, blue, (3 Rs. 8 As. per Than of 8 yards.) Donor ditto ditto.
149. Penchan, white cloth, (30-34 Rs. per Than of 27 by 1 yard.) Donor ditto ditto.
150. Punkhee, white, (2 Rs. per Than of 9 by 1 and 2 yards.) Donor ditto ditto.
151. Nimboo, green, (3 Rs. 8 As. per Than of 8 yards.) Donor ditto ditto.
152. Specimens of Mugah cloth, (unwashed.) Donor ditto ditto.
153. Cloth of the floss of the Mugah. Donor ditto ditto.
154. A piece of coarse Cotton (unwashed.)
155. A piece of striped Cotton. Donor H. Torrens, Esq.
156. A piece of white Cotton.
157. A coarse kind of red Cloth.
158. A Blanket of cotton and cotton thread.
159. A woollen Blanket, (striped.)
160. A Scarf.
161. A ditto ditto.
162. A piece of Cloth, made of the bark of the mulberry tree of the Friendly Islands. Donor Capt. P. Dillon. As. Res. Vol. xvi. App. v.
163-70. Eight ditto ditto.
171. Specimens of Cloth, made by the Javanese from the bark of the Upas tree. Donor Dr. R. Tytler.
172. A Coat, made of the bark of a tree, (Java.)
173. A Chandua, (cotton cover against the dew.)
174-198. Specimens of cotton and wool, manufactured at Nepaul, Tibet and Botan. Donor Dr. A. Campbell. As. Journ. vol. v. p. 127.
199. English Shawl from Herat.
200. Specimens of Tibetan sheep wool and cloth.
201. Ditto ditto of goats' wool.
202. Ditto ditto of Bactrian camel.

b. Of other Articles.

1. FROM INDIA.

203. A Box to keep chunam, (lime.)
204. A Box to keep shindúr, (Vermillion.)
205-206. Two small wooden Boxes from Java.
207. Golap-pass, a silver vessel for sprinkling rose-water.
209-211. Models of a complete set of the hooka. Donor Miss Tytler
212. A square Lantern of tin.
213. Silver ornament of a horse.
214. Bridles and Ornaments of a horse, (in a state of great decay.)
215-16. Two marble Cows with calves, from Joypore.
217. Ditto ditto Elephant, mounted.

218. Ditto ditto Horse, mounted.
219-20. Two wooden Horses, mounted.
221-222. Two wooden Elephants.

2. FROM AVA.

223. A set of playing Cards. Donor Dr. Tytler. As. Res. Vol. xvi, App. xiii.
224. Dominos. Donor R. Home, Esq. As. Res. Vol. xii, App. xxx.
225-27. Three metal Boxes.
228-29. Two more of a different shape.
230-60. Thirty-one specimens of Burmese Lacquered or Japanned-ware from Ava. Donor Major Burney. As. Journ Vol. i, p. 158.
261. Instrument for fixing the varnish.
262. Paper, made of the remains of vegetable matter, remarkable for its hygrometrical quality. Donor Mr. Swinton.
263. Paper made in India.
264-65. Two pieces of Leather, dressed with oil and tallow. Donor Mr. Swinton. 1833.

3. FROM NEPAL.

266 Ornamented Chata. Donor Dr. L. Burlini.
267. Ditto ditto. Donor Miss Tytler. As. Res. Vol. xv.
268-69. Two Steels for striking fire. Donor J. Brown, Esq. As. Res. Vol. xii. App xxi.
270. A Bowl of a Pipe, made of Arracan clay. Donor Dr. R. Tytler. As. Journ. Vol. v. May 1836.
271-72. Two Inkstands. Donor Dr. A. Campbell.
273-274. Two Inkstands with pencase, of peculiar construction.
275. A ditto ditto of copper.

4. FROM TIBET.

276-79. Four pairs of Spectacles. Presented by the Government of India. As. Res. vol. xvii. p. 622.
280. A pair of Eye-covers. Donor ditto ditto.
281. An Eye-cover, (Tibetan ?)
282. A pair of ear-covers Donor Government of India.
283. A ditto ditto, (Tibetan ?)
284. A Fan. Donor ditto ditto.
285. A ditto in a case. Donor ditto ditto.
286. A silk Fan Case, (Tibetan ?)
287. A silk Purse. Donor ditto ditto.
288. A silk Bag. Donor ditto ditto.
289. A ditto ditto, (Tibetan ?)
290. A silk Cover, (Tibetan ?)
291. A Brush with napkin. Donor ditto ditto.
292. A Watch Case. Donor ditto ditto.
293. Inkstand and Case. Donor ditto ditto.
294. Knife and Sticks. Donor ditto ditto.
295. Ditto ditto.

296. A wooden Cup. Donor ditto ditto.
297. A pair of Mogul Boots. Donor ditto ditto.
298. A ditto Shoes. Donor ditto ditto.
299. A Lantern in a tin case. Donor ditto ditto.
300. A ditto in a red box. Donor ditto ditto.
301. Cover for a snuff box. Donor ditto ditto.
302-304. Three Prayer Cylinders.
305. A Cashmere Box. Donor Mr. Moorcrooft. 1833.

5. FROM CHINA.

305. Four pair of Tea Cups and Saucers, from Ningpo. Donor Lieut. J. Brockman, Asiatic Journal, Vol. xi. p. 582.
306. Two ditto of Sugar-pots with plates. Donor ditto ditto.
307. Two plain Cups with covers. Donor ditto ditto.
308. A metallic Cup and Saucer. Donor ditto ditto.
309. Four porcelain Spoons. Donor ditto ditto.
310. A Tea-pot. Donor ditto ditto.
311. A pair of Wall Flower Vases. Donor ditto ditto.
312. Lock and Key. Donor ditto ditto.
313. A pair of Scales on the principle of the Steel-yard in a wooden box. Donor ditto ditto.
314. An Opium Box of tortoise-shell. Donor ditto ditto.
315. A brass Button of a Mandarin's cap. Donor ditto ditto.
316. A Coat made of Fur. Donor ditto ditto.
317. A Figure made of soap-stone. Donor ditto ditto.
318. A Mandarin's Cap. Donor Mr. F. D'Cruze.
319. A silk Scarf. Asiatic Journal, Vol. v. p. 383.
320. Soles of Chinese Shoes.
321. Chinese Chatta-hat of palm leaves. Donor Gen. Hardwicke. As Res. Vol. xv. App. xxxiii.
322-26. Chinese Hats of sizes.
327. Model of a China Lady's Foot. Donor W. K. Ord, Esq. As Res. Vol. xvi. App. xxi.
328. An Oil-burner.
329. A Pipe.
330-31. Two ditto. Donor R. Home. Esq. As. Res. Vol. xii. App. xxiv.
332-36. Five Pipes from Chinese Tartary.
337-38. Two Compasses. Donor R. Home, Esq. As. Res. Vol. xii. App. xxiv.
339. A set of China Chopsticks. Donor ditto ditto.
340. A ditto ditto.

Ornaments, Ornamental Implements, Dresses, &c.

341-46. Ornaments, worn by the Ooriah women, consisting of 4 Bracelets, a Ring and an Ear-ring. Donor Baboo Ramcomul Sen, As. Journ. Vol. v. p. 559.

347-48. Two brass Sticks for putting black powder into the eyes, used by the Hindus.

349. A brass Stick to colour the forehead.

350. An Ornament for the arm, worn by the natives of India.

351-52. Two brass Bracelets.

353. Lac Bracelets, used by the women of India. Donor Miss Tytler, As. Res. Vol. xiv. App. iii.

354-56. Three Armlets, worn by Shumasis.

357-58. Two pair brass Bracelets, worn by Shumasis, (from Java.)

359. Necklace of Shells. Donor Col. Morrison. 6th Nov. 1839.

360. Another smaller one.

361. Necklace of Seeds and Shells from Gurangupune. Donor J. Palmer, Esq., As. Res. Vol. xiv. Appendix xxix.

362-63. Two more of Shells.

364. A Necklace made of tulushi wood, and worn by the worshippers of Vishnu.

365-66. Two Necklaces of a kind of nut, worn by the worshippers of ditto.

367. Rudracsha Mala. Donor H. H. Wilson, Esq. As. Res. Vol. xii. App. xxiii.

368. A Necklace of Stone, worn by Fakeers.

369. A ditto ditto.

370. A ditto ditto.

371. A Hindu Beggar's Dress and Bag.

372. A ditto ditto Begging Dish made of Human Skull.

*Models of Implements, Specimens of Manufacture, Utensils, &c from the Eastern Islands.**

373. An Instrument to strike fire, from King George's Sound. Donor J. H. Stocqueler, Esq.

374. A Mallet from ditto ditto. Donor ditto ditto.

375-77. Three Wooden Dishes from the South Seas, Manicola, Tucopia and Majeer. Donor Capt. P. Dillon.

378. Fishing Line, &c. from the Eastern Islands. Donor R. Home. Esq. As. Res. Vol. xii. Appendix xxiv.

379. Sling from ditto ditto. Donor R. Home, Esq.

380. Ditto ditto.

381. A carved Ornament of a boat.

382-87. Pillows from the Friendly Islands. Donor Capt. P. Dillon. As. Res. Vol. xvi.

388. A Box from the Eastern Islands.

389. A Work Box from ditto ditto.

390. A Box from New Zealand. Donor Capt. P. Dillon, As. Res. Vol. xvi. App. ix.

391. A Work Box from ditto ditto. Donor ditto ditto.

392-93. Two carved Musical Instruments from the Eastern Islands.

394. Bracelets of Shells from ditto ditto.

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* See also 162 to 172.

395. Ditto of Boar Tusks. Donor R. Home, Esq. As. Res. Vol. xii. p. 23.
396. Ornaments from——
397-402. Mangeer Fans.
403-4. Two mother of pearl shell Ornaments of New Zealand Chiefs. Donor Gen. Hardwicke. As. Res. Vol. xii.
405. Cassava Bread from Dampier's Straits. Donor J. Bell, Esq. As. Journ. Vol. v. p. 517.

Curiosities and Sundry Articles.

406. A Lama's Thigh-bone (in the form of a flute.)
407. Specimens of mud casts of the Lingam, which are worshipped by the Hindus, while performing their ablutions.
408. Model of a Granary.
409. Fragment of the tusk of an Elephant with a ball.
410. A piece of Planking and Copper Sheathing from the bottom of the Ship *Adele*, pierced by the horn of Narwhal on her voyage from Penang to Akyab, on the 24th January, 1833.
411. Copper from the bottom of the Ship *Guide*, struck by lightning while in dock. Donor J. M. Seppings, Esq.
412. Cover of a box.
413. Specimens of Horse Shoes.
414. Specimens of Malacca Tin, presented by Lieut. Newbold. 1835.
415. Malayan Head-dresses, presented by Gen. Hardwicke. As. Res. Vol. xii.
416. Two Malayan Pipes.

Musical Instruments.

NEPALESE.

1-2-3. Horns, called in Hindee Bhorang. Donor M. S. Bramley, Esq.
4. Bass Horn, of copper, called Singha Donor ditto ditto.
5-6-7. Hautboys, or Sanáis. Donor ditto ditto.
8. Trumpet, or Phonga, Newari. Donor Dr. A. Campbell.
9-10. Flageolet, or Mohalli. Donor ditto ditto.
11-12. Horns, or Singha, Nepal. Donor ditto ditto.
13. Nug Pheni, or Turi, Parbattiahs. Donor ditto ditto.
14. Bansuli, Flute or Fife. Donor ditto ditto.
15. Beli, or Krisna-beli, Newari flute. *Donor ditto ditto.*

COLE COUNTRY.

16. Tampoorah, used by the hill people near Hazaribagh. Donor Lieut. J. Audry.
17. Ektarraw ditto ditto Donor H. H. Wilson, Esq. Donor Baboo Ramcomul Sen.

BENGALESE.

18. Khartala. Donor H. H. Wilson, Esq.
19. Gojee. *Donor ditto ditto*

20. Doobdoobi
21. Been Setara.
22. Setara.
23. Serang.
24. Sarinda.
25. Bank.
26. Bhorang.
27. Bansuli.
28. A pair of Kartala.
29. A ditto small ditto.
30. A pair of Mandira.
31. Jhanj.
32. Kansara.
33-34. Sanayis.
35. Dhola.
36. Dholaka.
37. Jaraghayi.
38. Tasa.
39. Dagara.
40. Kada.
41. Ram-a-Kada
42. Dhamsha.
43. Tikaras.
44. Jayadhak
45 Mridanga.
46. Madala.
47. Pakwaz.
48. A pair of Tabla.
49. Dampa.
50. Dara.
51. Khanjaris.
52-53-54. Sanayis.

CHINESE.

55. Flute. Donor, Dr. R. Tytler.

BURMESE.

56-57. Fiddles.
58. Harp.

UNIDENTIFIED.

59. A double Flute or Fife.
60. A Fiddle.
61. A Bamboo Flute.
62-63. Bamboo Flutes.

Armour and Weapons.

a. NEPALESE.

1 to 4. Swords. Donor, B. H. Hodgson, Esq.

5 to 12. Swords.

13-14. Sword, Kukri and Khonta. Donor Genl. Bhima Sinha, Journ. As. Soc. Vol. v. p. 56.

15. A Dagger. Donor ditto ditto.

16-17. Daggers.

b. ORISSA.

18. Battle Axe. Donor J. G. Balmain, Esq.

19. Six Arrows from the hills of Kuttuck, used by the Paiks. Donor ditto ditto.

c. NAGA.

20-21. Spears. Donor Mr. Milne.

22-23. Swords. Donor ditto ditto.

24-25. Battle Axes. Donor ditto ditto.

26-27. Swords.

28. War Cap, worn by the chiefs. Donor Mr. Milne.

d. HINDUSTANI.

29. Sword dug up from six feet under the bed of the Jumna river. Donor Lieut. Burt.

30 to 35-36. Cut-an-thrust sword. Donor H. Torrens, Esq. As. Journ. May 1842.

37 to 41. Copper Weapons found in the earth near Futtehgerh. Donor T. Williams, Esq.

42. Copper Dagger.

43 to 46. Daggers.

47. Copper Head of a Spear. Donor Capt. Presgrave.

48 to 51. Blades of Spears.

52 to 65. Spears, (silver mounted.)

66-67-68. Spears, (brass mounted.)

69 to 74. Spears, (plain ones.)

75. Matchlock. Donor W. L. Gibbon, Esq.

76. A single barrel Gun, with double lock. Donor Lieut. Anderson.

77 to 82. Battle Axes.

83-84-85. Chain Shirts.

86-87. Chain Collars.

88 to 91. Iron Breast Plates.

92 to 95. Ditto Plates for the back.

96. Ditto Helmet.

97. Ditto ditto, covered with iron net.

98. A Cap.

99-100. Two Gauntlets.

MERGUI.

101-102. Shields used by the warriors.

103. Helmet.

104. Brass Collar.

105. A pair rattan Cases, worn on the legs, under the slight bamboo rings, to give the calf a large appearance.

ASSAM.

106. Sword. Donor Dr. L. Burlini.

107. Bhotian Standard, carried before the King in war. Donor Capt. Bogle.

CHOTA NAGPORE.

108-109. Iron Shields.

110. A brass Shield. Donor G. W. Hamilton, Esq.

111. Chok-krow.

BURMESE.

112. Sword, with silver mounted scabbard and handle.

113. War-hat, worn by the Singphos. Donor Col. A. Burney.

MALAYAN.

114. An ornamented Spear. Donor Capt. M. Kittoe.

115. Lahore Matchlock, purchased from one of Runjeet Singhs' Jhounhurras. Donor H. Torrens, Esq. As. J. May 1842.

116 to 17. Two Peshawer fire-locks, mounted, one after the Native and one after the English fashion; the locks made by Cashmeree Gunsmiths of Ludiana, to imitate Towerlocks. Donor H. Torrens, Esq. May 1843.

118. A Gun. Donor ditto ditto.

119. A Knife used by the Tribes about the Khyber Pass, or Afreddees, Momunds, &c. Donor ditto ditto.

120. Pirate's Dart Tube. Donor Lieut. C. Mackenzie. Journ. As. Soc. Vol. v. p. 517

121. Ditto ditto, with a blade answering for spear.

122 to 124. Swords.

125 to 127. Krises.

128. Malay Pirate's Quiver, containing poisoned darts. Donor Lieut. Mackenzie.

129. Ditto ditto, containing poisoned darts and small arrows.

130. Spear with double blades.

131-132. Spears, (brass mounted.)

133. Spear.

134 to 139. Spears.

140 to 141. Ditto.

142 to 147. Ditto.

CHINESE.

148. Sword from Amoy. Donor H. Torrens, Esq.

149. Chain-shot, with chain enclosed, from Chusan. Donor ditto ditto.

150. Standard from the Bogue Fort. Donor ditto ditto.

151-152. Two Bows, (deposited.)

153. A Quiver, with 30 arrows, (ditto.)

154. A three barrelled Pistol, found in the Chief Commissioner's house at Chusan, October, 1841. Donor J. C. Hutchinson, Esq.

155 A Cross Bow found in the Gun Carriage Manufactory, Chinhae, October 1841. Donor ditto ditto.

156. A Quiver from Chusan, taken August, 1840. Donor ditto ditto.

157. A Tartar Bow from Ningpo. Donor ditto ditto.

158. Eleven Arrows, taken from the Arsenal in Chusan, August 1840. Donor ditto ditto.

159. A Helmet of a Tartar Soldier, taken from the Arsenal in Ningpo. Donor ditto ditto.

SOUTH SEA ISLANDS.

160 to 163. Spears.

164 to 173. Clubs from the Friendly and Feejee Islands. Donor Capt. Dillon. As. Res. XV. App. 9.

174. Club from New Zealand. Donor ditto ditto.

175 to 173. Manicolo Clubs. Donor ditto ditto.

174 to 198. Clubs.

199. Paddles and Oars.

200. Battle Axe of whale-bone, answering to a carving knife, from New Zealand. Donor Capt. P. Dillon.

201-202. Green Zade (Axe-stone) Battle Axe, from ditto ditto. Donor ditto ditto.

203. Stone Battle Axes. Donor ditto ditto.

204 to 205. Stone Battle Axes from Mangeer a Island. Donor ditto ditto.

206. Stone Battle Axe, from New Zealand.

207. Copper Shield.

208. Wooden Shield.

EUROPEAN.

209. Sword of Her Highness The Begum Sumroo, which she had worn from the year 1778, to the day of her death, and which was always kept by her bed-side. Donor Mr. Dyce Sombre.

210. Spanish Gun.

Read the following letter, dated Paris, 2nd February, 1843, from Major A Troyer:—

Paris, 2nd February, 1843.

MY DEAR TORRENS,—I had the pleasure of sending you a letter by Baboo Dwarkanath, who must have arrived in Calcutta sometime ago. Now, I avail myself of the opportunity offered me by Mr. Oatley, of the Madras Cavalry, who goes to India via Marseilles and Suez, &c.

In my last letter to you, I touched upon some points, upon which I shall be very happy to receive a few lines from you. How is the copying of the Vedas for the French Government going on ? It is now a considerable time since the Asiatic Society of Paris has not received the least communication from you. You cannot imagine what pleasure every thing which comes from Calcutta, causes here in Paris. No. 123 is the last No. of your Asiatic Journal which we received. The political and military affairs in India having now taken a very advantageous turn, it may be expected that some more attention will be bestowed upon peaceable and literary pursuits by some of the many distinguished individuals who live in India. Will you have some more leisure to give us some tract of yours, or a printed edition of some oriental work ? Mr. Brookhaus is a very respectable Sanskrit scholar, who sent you some time ago his edition of the *Vrihat Kutha*, with a German translation; he is since several years occupied with the study of Indian tales, and would be very happy to see an edition of the whole Sanscrit work published in Calcutta. I suppose Professor Wilson wrote to the Society about this subject, and recommended it to you as a very laudable undertaking. As to my own occupation—I can but repeat to you that I am still busy here in Paris with the printing of the English translation of the Dabistan, in three volumes, which I hope to be able to terminate in the course of this year. In my last letter I took the liberty to request you to propose to the Society, the nomination of M. Julius Mohl as an honorary member; I beg to repeat my request, on the risk of being thought very intrusive, but not without hope to be excused and pardoned by you. The communication between India and France by the way of Egypt having become so easy and rapid, we may flatter ourselves to hear a little more frequently of you, and of the Asiatic Society of Calcutta; with this flattering hope, let me offer you my best wishes for the continuation of your health and happiness.

Yours most truly,

A. TROYER.

Read the following report from the Curator of the Museum Economic Geology, for the month of March 1843.

Report of the Curator Museum of Economic Geology, for the month of March.

Museum of Economic Geology.—I have the pleasure to announce in this month the discovery of copper ore on Round Island, a small islet off the S. E. end of the Island of Cheduba. The specimens exhibited were forwarded from Ramree by Captain D. Williams, Principal Assistant to the Commissioner of Arracan, who states that they were discovered by a Mug named Neokein, whom he had employed to search for coal. They consist of nodules of native copper, with red and black oxide and silicate of copper. The absence of the sulphurets or arseniates which I have not yet found amongst the specimens, render the ore of a very valuable kind, and if abundant, it will be of much importance. So pure is it, that Captain Williams sends with it a ring made from it by a native workman, which is on the table with the specimens. I have written to him for more abundant supply, and for details on the nature of the vein, rocks, and any other associated ores or minerals which may be found with it, from which some idea of its value as a mining site may be deduced, and due report made, to Government on the subject.

COPPER ORES.

No. 1604.

Ramree, Arracan, March 7, 1843.

MY DEAR SIR,—I now do myself the pleasure of submitting to you, the information you require regarding the copper ore I sent you.

It was obtained on Round Island, which on reference to a chart of this coast at the Marine Board Office, you will find to be an island on the East Coast of Chedooba Island, a little North of Flat Island. There is fresh water on the island, and ships may anchor close to it; plenty of fuel procurable at the spot. The ore was found by digging for it, and I hope soon to be able to send you specimens of the rock and soil in which it is imbedded.

With regard to the volcano: on a former eruption I forwarded a specimen of a fish thrown up by the volcano, (so the natives say,) to the late Mr. Prinsep, which is now in the Museum of the Society.* The volcano hill is close to Kyouk Phyoo, and Mr. Howe will no doubt forward to you what you want.

Yours truly,
D. Williams.

I forward all the copper ore I can *now* procure from Neokein. He will proceed to dig for more, and bring specimens of the earth and stones.

Having addressed the Sudder Board of Revenue N. W. P. as follows:—

The Secretary of the Sudder Board of Revenue, N. W. P.

Sir,—I am directed by the Committee of Papers of the Asiatic Society to request you will be pleased to submit to the Board, or to the proper authorities, their application for a complete set of the Revenue Survey Maps of the various districts under the Government of Agra, for the use of the Museum of Economic Geology of India, of which the objects are briefly detailed in the circular herewith.

2. As also that the Board will be pleased to assist the objects of the institution by distributing to its various officers the accompanying circulars (of which more will be sent if desired) with its recommendation of their object, as being a matter of the highest import to the financial interests of the country.

I have the honor, to be, &c.
(Signed) H. Piddington,
Acting Secretary, Asiatic Society, and Curator Museum Economic Geology of India.

Asiatic Society's Rooms,
The 23rd Feb. 1843.

I received the following reply, and the district Maps sent are now upon the table. Our best thanks are due to the Board for its very liberal assistance, and I anticipate with confidence, from the numerous opportunities which its officers have before them, many important additions to our stores.

No. 31 of 1843.

From H. M. Elliot, Esq. *Secretary to the Sudder Board of Revenue, N. W. P. Allahabad, to* H. Piddington, Esq. *Acting Secretary Asiatic Society of Calcutta.*

Sir,—I have the honour to acknowledge the receipt of your letter of the 23rd ultimo, and to inform you that as requested therein, a set of the Lithographed Maps noted below has been forwarded to your address for the Museum of Economic Geology.

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* I regret to say that it cannot be found.—H. P.

2. The Printed Circulars, received with your letter, have been distributed to Commissioners of Divisions.

I have the honor, to be, &c.

Your most obedient servant,

H. M. Elliot, *Secretary.*

Sudder Board of Revenue, N. W. P.
Allahabad, the 14th March, 1843.

List of Maps.

1 Map of Ghazeepoor, on Drawing Paper, colored.
1 ditto ,, Benares, ditto.
1 ditto ,, Jaloun, ditto.
1 ditto ,, Jounpoor, ditto.
1 ditto ,, Allahabad, ditto.
1 ditto ,, Futtehpoor, ditto.
1 ditto ,, Cawnpoor, ditto.
1 ditto ,, Humeerpoor, ditto.
1 ditto ,, Bandah, ditto.
1 ditto ,, Agra, ditto.
1 ditto ,, Etawah, ditto.
1 ditto ,, Muttra, ditto.
1 ditto ,, Furruckabad, ditto.
1 ditto ,, Barreilly, ditto.
1 ditto ,, Bijnour, ditto.
1 ditto ,, Shahjehanpoor, ditto.
1 ditto ,, Moradabad, ditto.
1 ditto ,, Budaon, ditto.
1 ditto ,, Pillibheet, ditto.
1 ditto ,, Delhi, ditto.
1 ditto ,, Paneeput, ditto.
1 ditto ,, Hurrianah, ditto.
1 ditto ,, Goorgaon, ditto.
1 ditto ,, Bhutteeanath, ditto.
1 ditto ,, Meerut, ditto.
1 ditto ,, Boolundshuhur, ditto.
1 ditto ,, Moozuffurnuggur, ditto.
1 ditto ,, Seharunpoor, ditto.
1 ditto ,, Goruckpoor, ditto.

1 Map of Allygurh, on Drawing Paper colored.
1 ditto „ Dehra Doon, ditto.
1 ditto „ Mynpooree, ditto

Mineralogical and Geological Department.—I mentioned in my report of February the notice which I had incidentally received of the brilliant eruptions of the small volcano of Kyook Phyoo, and that I had written to Mr. Howe for details and specimens. These he has very kindly furnished, in replies to my queries, and a chest of specimens of great interest, of which a selection is now on the table.

I am busy examining these, and the results of my work will form a separate paper.

It seems probable, that the mud and the grey shale are nearly the same substance' and the grey shale and brick-red clay slate certainly are so ; for we have one specimen which is grey shale at one end, and brick-red clay slate at the other, with the dark, half calcined-shale in the middle, thus shewing that the metamorphic process had just reached so far. This is not uncommon where dykes have penetrated argillaceous shales ; but I am not aware of any instance in which it is known to be actually going on as it here appears to be, except that it may be supposed to be so in burning coal mines.

Another remarkable singularity in these specimens, which I may briefly notice here, is the low heat of the volcanic flame. Mr. Howe's letter says distinctly, that the station at midnight was rendered as light as day by the flame from the volcano though at 3 or 4 miles distance ; and yet we find that the specimens from the sides of the crater are barely calcined, and nowhere approach to fusion. There is no doubt, that the different mud volcanos on Ramree are truly volcanic *fumaroli*,* as may be seen by reference to Lieut. Foley's paper in Vol. iv. of our Journal, and the value of this fact consists in the confirmation which it affords of Mr. Lyell's surmise as to the ancient volcanos of the Eifel. I forbear further remarks here, as in our conclusions so much must depend on the mineralogical character of the specimens which are yet under examination.

We have received from Dr. Harlan, the splendid collection of casts of new Missourian fossils, which is now on the table. His letter to our associate Dr. Huffnagle, who has placed it in my hands as Officiating Secretary, is as follows :—

Philadelphia, July 21, 1842.

Dear Sir,—It is a long time since I have had the pleasure of hearing from you directly, and an opportunity now offering from our port, I seize the occasion to address you, and of forwarding through you, a collection of the casts of fossil bones found in Missouri, and of which I have made a new genus of extinct quadrupeds; a printed notice of these bones accompanies them, as also some other specimens duly labelled, which I beg the Asiatic Society to accept from me as a slight testimony on my part, to the liberal manner they treat their foreign members. I have been absent two years in Europe since I heard directly from you, and on examining my copies of the Asiatic Journal, I find the following numbers have never reached me; viz. 77, 78, 79, 81, 82, 83, 86, 87, 88, 89, 90, 97, 98, 99.—No. 113, is the last come to hand; perhaps you could by application, obtain for me the completion and perfection of my copy of this valuable publication. And if you could aid me by sending for my cabinet any specimens in the department of Comparative Anatomy, you would confer a great favour. I was so unfortunate, during my absence in Europe, as to lose all my anatomical collections by fire, the labour of twenty years. The Professors of the Garden of Plants in Paris, on receiving intelligence of my great and irreparable loss, presented me with a very fine nucleus to form another cabinet, and I am emboldened to ask assistance of all my friendly Correspondents.

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* Though not affording sulphureous or saline exhalation.

A full account of my new fossil bones, *Orycterotherium Missouriensis*, is not yet published, as it will be I hope soon with plates, when I shall not fail to send copies to foreign Correspondents.

As regards specimens in Comparative Anatomy for my cabinet, which is intended to illustrate a series of lectures on Comparative Anatomy and Physical History of Man, any bones, fossil or recent, or casts of them, would not come amiss, but I am particularly desirous to obtain skulls and teeth. R. HARLAN.

The following Gentlemen were proposed and elected as Members of the Committee of Papers, for the current year 1843; viz.

Vice-Presidents.

Right Rev. the Lord Bishop of Calcutta.
Sir J. P. Grant.
Sir H. W. Seton
H. Torrens, Esq.

Members.

Lieutenant Colonel W. N. Forbes,
W. P. Grant, Esq.
Lieut. A. Broome of the Horse Artillery.
C. Huffnagle, Esq.
Dr. J. Hæberlin.
N. B. E. Baillie, Esq
S. G. T. Heatly, Esq.
Baboo Prosono Coomar Tagore.

For all the presentations and contributions, the thanks of the Society were accorded to the Donors.

JOURNAL

OF THE

ASIATIC SOCIETY.

AN EIGHTH *Memoir on the Law of Storms in India, being researches relative to the Storm in the Bay of Bengal, at Madras, and in the Arabian Sea, of* 22*d to* 31*st October*, 1842, *with two charts. By* HENRY PIDDINGTON.

On the 24th October 1842, a severe hurricane was experienced at Madras and other ports on the Coromandel Coast, in which several ships were wrecked or foundered at sea, and much other damage was done. It is the object of the present memoir to trace out the track of this storm, which, there is no doubt, crossed the Peninsula, and is traceable from the Andaman Islands to latitude 14° N., longitude 60° E., or within 6 degrees of the Island of Socotra, an extent far exceeding that to which any Indian Storm has yet been tracked.

The principal sources of information which I have, are from the documents forwarded to me by Captain Biden, the Master Attendant of Madras, who has been most indefatigable in profiting by the advantages which his official position afforded him. It is, therefore, to his zeal in the cause of science, that we mainly owe this memoir; for what I could collect in Calcutta, was so meagre, that it would have been but of little avail in tracing the storm as we have now done.

From the Peninsula, I have reports from Captain Campbell, Revenue Surveyor South of India, Captain Newbold, M. N. I. Assist. Comr. Kurnool, Mr. Crozier, Collector at Malabar, M. Bourgoin, Governor of Karical, and Mr. Buist in charge of the Observatory at Bombay. These gentlemen have been most indefatigable in their endeavours to procure me all data within their reach, or that of their friends, and I am much indebted to them for their most ready assistance. I have as usual, noted with every document the sources from whence it was obtained.

I commence, as in my former Memoirs, by giving the documents, abbreviated as much as is consistent with clearness and accuracy of detail; and of these I have first chosen those farthest to the Eastward. I shall then give comparative tables, and lastly, a general summary and remarks, shewing upon what data, and according to what probabilities, when data do not exist, the tracks and storm circles of the charts are laid down. The general reader I trust, finds this part quite *readable*, and the mariner and man of science will be able to judge of the correctness of my inferences from the documents. I shall be greatly obliged by their remarks and corrections from any part of the world; and if at times I may seem to have registered too many details, it will be remembered that all details, and these given with fidelity, are the essential elements for the successful investigation of every complex physical problem, and most especially those relating to a new branch of meteorology.

Abridged Log of the Brig WATERLOO, *Capt. Moore, reduced to civil time. Forwarded by Capt. Biden.*

20th October.—At daylight strong breezes N. N. E. hazy weather, *several water spouts to the South-west and N. E.*, with a heavy swell from the N. E. Little Andaman at noon N. E. Latitude 10° 16′ N., longitude Chron. 92° 23′ E. P. M. Winds N. N. E. to N. E. to midnight. Sunset squally. Midnight strong squalls

21st October.—Daylight fresh breezes, to noon, when Lat. 11° 52′ N., longitude Chron. 91° 16′. P. M. fresh breezes N. N. E. increasing to midnight.

22d October.—1 A. M. fresh gales N. N. E., daylight increasing, down top gallant yards and masts, and prepared for bad weather. 8 A. M. heavy gales N. E. with squalls and rain, heavy sea running, and vessel labouring much. Latitude 13° 27′ N., longitude Chron. 90° 03′ E. 1 P. M. heavy gales, squalls, rain, and sea to midnight.

23d October.—Midnight *wind East*, more moderate. At daylight more so, all sail set by noon, when Latitude 14° 45′ N., longitude

Chron. 28° 55′ E. The wind South, S. E. and S. S. E. squally and variable to midnight.

24th October.—Midnight to noon, fresh breeze and cloudy. Noon, Latitude 14° 44′ N., longitude 86° 38′ E.

Abridged Log of the Ship LADY FEVERSHAM *from Calcutta to Bombay, reduced to civil time. From Capt. Biden.*

22d October.—At noon, by log worked back from 24th, lat. 12° 45′ ½ N. long. 86° 5′ E. P. M. increasing winds with a squally appearance, N. and N. by W. to midnight. At 11, blowing a gale, midnight wind increasing with lightning, furled the foresail, from noon to midnight had run 80 miles S. by E. and S., and 7 miles more to 1 A. M. of the 23d, placing the ship at midnight in lat. 11° 26¼′, long. 86° 22′ E.

23d October,—At 1 A. M. finding it impossible to run the ship longer, clued up the main top sail. At 1h. 30m. blowing a complete hurricane, when the ship broached to the wind. Bar. at 2 P. M. of 22d, 29.70. At 11 P. M. 29.40. and at 1 A. M. of 23rd 28.40. At 1h. 45m. P. M. blowing a dreadful hurricane at N.; the main and mizen masts fell over on the starboard side, carrying with them the fore top mast; cut away the wreck as quick as possible, and cleared the mast from the ship's sides. At 2h. 45m. the wind suddenly lulled, when the ship fell off and rolled in a most dreadful manner; a sea struck her abaft, which stove in four of the upper stern windows, washing away all the bulk heads in the cuddy, luggage, medicine chest, and every possible thing, however well secured. At 3, the wind shifted to the South and blew furiously, *so that no one could stand on deck;* lost quarter boats, hen coops, binnacles, bulwarks, and sails fore and aft, the long boat nearly filled, and all the stock drowned. At 3h. 30m., the hurricane at its greatest force. Bar. at 28.30. At 5h. commenced to abate, mustered all hands and found the chief mate and one seaman seriously injured, sounded the pumps at three feet and six inches, turned to and pumped her out. The main yard having fallen through the deck on the starboard side, was the cause of so much water being in the ship, boused it up and secured the hole, cleared and cut away the remainder of the wreck; still a heavy sea, but wind gradually abating. At noon strong winds at E. S. E. with heavy squalls and rain, all hands employed getting prepared to make some sail. At noon lat. observed 12° 4′ N. P. M. strong winds and squally with less sea, all hands employed clearing away. At sunset pumped ship at two feet, squared the fore yard, and made all clear for getting some sail up. Midnight moderate winds at E. S. E., ship's head from N. N. E. to N. E.

24th October.—Day-light bent the fore sail, and fore top mast stay sail, set them, the mizen gaff towing astern got it in, and rigged it for a fore try sail. Noon moderate weather, with occasional squalls of rain. Lat. observed 13° 16′ N. long. by Chron. 86° 85′ E. Course made from Saturday at noon N., 16° W. 32 miles.

The following abstract of the Log of the Ship WHITBY, *alluded to by Capt. Biden, was subsequently forwarded to me by that gentleman, but unfortunately the place of the vessel is nowhere noted. Captain Biden thinks, she must have been about* 30 *leagues to the Eastward of the* LONDON, *but how far South we are ignorant. I have thus not marked her position on the chart. It is possible that the Brig alluded to was the* ANN METCALFE, *though in her Log the loss of the fore topmast is not alluded to, and a note indorsed on the extract says only, that she had* " SPRUNG a topmast, and put in to refit." *I suppose* " *lost*" *may have been intended. With the* ANN METCALFE *also, the shift takes place at noon, and with the* WHITBY *at about* 9 *A. M. though in such weather the time is seldom exactly noted.*

On the afternoon of the 22d October, the weather was hazy, with moderate breeze at N. N. E. The appearance to windward was such as North country seamen call " *greasy.*" The Barometer fell in the course of the day from 30·10 to 29·90, the breeze increased during the night with occasional showers, and veered to N. N. W. At midnight, the Barometer 29.78. About 3 A. M. 23d, the storm commenced at N. N. W., increasing until 7 A. M., when it blew a perfect hurricane, veering to N. N. E. and N. E. with lightning; the Bar. now fell rapidly, and at 8 A. M. stood at 28.45, having fallen 1.65 in 20 hours. At 9 A. M. after a most violent gust at E. N. E. it suddenly fell a dead calm. *A Brig was then in sight without a fore topmast.** A large number of birds of the Petrel genus alighted on board, and took shelter in the boats and under hencoops. At 10-30, the wind sprung up suddenly from S. W., veered to South, and 11-30 to S. E., and again blew with increased violence, accompanied with rain; the Bar. rising slowly. At 1 P. M. the Bar. rose rapidly, the storm gradually abated with heavy rain, and at 6 P. M. settled down to an ordinary gale, at which time the Bar. was 29.86. Throughout the night, the wind gradually abated, and at sunrise brought fine weather, with a steady breeze at S. E. which continued throughout the day. The Bar. rising to 30.15.

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* Possibly the *Ann Metcalfe*, as above.

This short account will enable you to compare the time and direction of the storm as it occurred at Madras, and I hope to add to the facts necessary to elucidate the theory of storms. It appears to me, that from the sudden changes and extreme violence of the wind, I must have been near its vortex at the time whence it gyrated towards your coast, as it certainly did not extend any distance to the Eastward. I have only further to add, that although I have twice encountered hurricanes in the West Indies, I do not think they surpassed the late storm in violence when at its height.

I sustained but little damage in my spars, but lost most of my sails, also a seaman, and one of my boats, which last was blown completely over the poop from the davits.

Wm. Lacy *Whitby.*

Note.—Subsequent to closing my letter, I find on reference to my Journal, that the Barometer fell to 27.45. at 8 A. M. October 23, which makes the fall of mercury 2 inches and 65-hundredths, a change I have rarely experienced even in high latitudes, in so short a period. This fact is further corroborated by the account of Surgeon Tait, who at my request took note of the changes.

The following letter I received when this Memoir was nearly ready for the press, giving an account of the foundering of the Ship Washington, *Capt. Barnes, in consequence of injury sustained in the Storm. I am indebted for it to Messrs.* Glass *and* Co. *of Calcutta.*

(Copy.)

Messrs. Glass and Co.

On board Sir Robert Peel.

Gentlemen,—I deeply regret to have to inform you, that the *Washington* foundered in the Bay of Bengal on the 25th October, in long.

86° 14′ E. lat. 13° 29′ N. from the effects of a dreadful hurricane on the 22d from the Eastward, in which she was dismasted. We were received on board the *Sir Robert Peel* of Aberdeen, David Craig, Master, from Calcutta, bound to London, on the 25th, but six of the crew were received on board the *Lord Glenelg* on the 1st November. About one-half of the sugar was pumped up before we left her, and the rest all damaged, as well as the hides and turmeric. We had only time to save part of the stores and clothes. I lost the most of mine, and what was saved, are damaged with salt water. Although we saw next morning after the disaster, a vessel of 6 or 700 tons with only the foremast standing, I do not think it was of great extent, at least in a Northerly direction, as the *Robert Peel* had fine weather on the 22d, with a heavy swell, by which she carried away her fore-top-mast and main topgallant-mast; at the time she was distant in a Northerly direction about 180 miles from us. Had the *Washington* continued tight, we might have got in with the land about Madras, the nearest port; but as every one had to take his share of pumping by day and night to keep her from sinking, none could be spared to rig jury-masts, and get the sails bent; in fact every one was almost worn out before we got on board the *Sir Robert Peel.*

I close this to say, that we arrived here yesterday, and sail to-day, and hoping this will find you well.

St. Helena, Jan. 4, 1842. D. BARNES.

Log of the Brig ANN METCALFE, *J. Errington, Commander, reduced to civil time. Forwarded by Capt. Biden.*

22d October.—Saturday, noon, commences with moderate breeze from the N. E. with thick hazy weather, and occasional showers of rain. Barometer 29.70. At 4 P. M. increasing breeze with continued small rain. Barometer 29.60. At 8 P. M. wind still increasing, with a strong sea from the Northward. Barometer 29.40. Midnight very thick with constant rain, both wind and sea increasing fast from the Northward. Barometer 29.20. Thermometer 75°.

23d October.—Sunday, at 4 A. M. wind increased to a gale from the Northward, with a tremendous sea; at 8 A. M. it blew a complete hurricane from the Northward, the sea running very high. Bar. 28.70.

Noon, wind lulled for the space of half an hour, and shifted to the South, and blew a hurricane from that quarter also, which caused the sea to run up in the shape of a cone, making it very dangerous for a ship to live in. Lat. account 12° 0′ North, longitude 85° 30′ East. At 4 P. M. wind still at South, with a tremendous heavy sea, ship laying to, under bare poles, as no canvas would stand to it. Barometer 28.50. At 8 P. M. a little more moderate, but sea still very high. Barometer upon the rise 28.80.

Midnight cloudy, but more moderate, and sea falling; made sail to trysail and foresail. Barometer still rising and 29.00.

24th October.—Monday at 4 A. M. wind from the S. S. E. still moderating, and sea going down. Barometer 29.20.

At 8 A. M. wind still from the S. S. E. and moderating fast, sky beginning to break through the clouds. Barometer 29.50.

Noon, moderate and fine, clear sky, with sea decreasing, wind at S. E. latitude observed 12° 6′ N. longitude Chron. 84° 30′ E.; ship arrived at Madras on the 29th October. JOHN ERRINGTON,

Commander.

Abridged Log of the Ship LONDON, *from Madras to Moulmein, reduced to civil time. Forwarded by Capt. Biden*

22d October.—P. M. to midnight, fresh breeze from N. E., and increasing with squalls. Ship standing to the E. S. E. about 22 miles in the 12 hours. Bar. 29.75.

23d October.—A. M. strong breeze N. E. increasing with squalls, and heavy head sea. At 6, wind N. N. E. At 8, increasing gale with heavy gusts, close reefed topsails. Bar. 29.80. Ther. 81°. Noon, strong gale, frequent violent squalls and heavy sea. Bar. 29.70. Lat. by account 12° 56′ N. long. 83° 55′ E. P. M. wind N. E. increasing; frequent heavy squalls, lying to with head to the S. E. 4 P. M. Bar. 29.70. 8 P. M. wind E. N. E. Midnight heavy gale with frequent violent squalls.

24th October.—1 A. M. Bar. 29.50. At 2, wind marked S. E. with the same. At 6, wore to the N. E. Noon Bar. 29.70. to 29.50.*

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* So in the MSS. I do not find it mentioned that there were two, and the Bar. cannot I think have varied so much in the squalls. I suppose the meaning to be, that between midnight and noon the Bar. had risen from 29.50. to 29.70.

Ther. 81°; fresh gales, but made some sail. Lat. by indifferent observation 12° 34′ N. long. 83° 44′ E. P. M. wind E. S. E. strong breeze. At 8 P. M. more moderate. Midnight fine. Bar. 29.50.

25th October.—Fine wind S. E. Lat. 13° 20′ N. long. 84° 70′ E. Bar. 30.05. Ther. 82° or 84°.

Abridged Log of the Barque SARAH, *Capt. Walker, reduced to civil time. Forwarded by Capt. Biden.*

The *Sarah* by her log worked back from noon of the 24th, appears to have been at noon 22d October in about lat. 14° 52′ N. long. 83° 24′ E. At 1 P. M. of which day a steady breeze from N. E. sprung up, increasing to a fresh breeze with cloudy weather, and a heavy sea at midnight; wind N. E.

23d October.—Daylight increasing N. E. wind, with a turbulent sea. Noon, Bar. 29.73. Lat. account 14° 07′, long. account 84° 24′ E. Squalls increasing in rapidity and violence, till a little after noon she hove to. P. M. wind N. N. E., blowing a gale. 6 P. M. N. E. tremendous sea, vessel laboring greatly.

Barometer as follows; viz.

1 P. M.	29.70
2 ,,	29.65
3 ,,	29.62
4 ,,	29.56
6 ,,	29.60.

24th October.—A. M. wind veering from N. E. by E. to East. At 4 P. M. Bar. 29.63. At 7, 29.68. At 8, 29.73. At 8 A. M. moderated a little, and veered to E. by S. wore and scudded; wind East. Noon strong gales E. by S. Lat. observed 13° 34′ N. long. observed 83° 53′ East. At 2 A. M. passed a large ship, which had lost all her topmasts.

Abridged Log of the Barque STALKART, *Capt. A. R. Dixon, from Colombo to Madras.*

22d October.—At noon in lat. 12° 10′ N., long. account 80° 33′ E.* Fresh breeze N. by E. and cloudy, *high sea from the N. E.* At 4 P. M.

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* This longitude and those of the 23d and 24th are obtained by working back the log from the 25th, on which day only the longitude is given.

and in the evening threatening, made preparations for bad weather, wind marked N. E. At 3 P. M. wind "variable" to midnight, though the course is constantly E. by S.; midnight fine.

23d October.—2-30 hard squall; 3, sea increasing; lat. by Rigel in Orion 12° 03′ N.; by 5 A. M. hard gales N. N. E. 7-10, very threatening weather, secured every thing. Noon squally, and high turbulent sea, sun obscured. Lat. by account 11° 33′ N. long. account 80° 58′. The wind Northerly, hard gales, every appearance of a hurricane. By 10 P. M. blowing a hurricane from N. N. W., sea rising in pyramids.

24th October.—4 A. M. wind veered to the Westward. At 6, marked West, blowing with great violence, sea making a clear breach over all, hove to with a tarpaulin in the mizen rigging. 10 A. M. wind W. S. W. Noon more moderate, sea not quite so agitated, thick and cloudy. No observation. Lat. by account 11° 33′, long. 81° 31′ E. P. M. strong gales South, squally unsettled weather. At 6, more moderate. At midnight pleasant breeze.

25th October.—4 A. M. lat. by moon and Sirius 12° 13′ North. At noon lat. 12° 46′ N. long. 80° 55′ E.

Abridged Log of the Bark FAVORITE, *Capt. W. F. Wilkins, from Madras to Vizagapatam, reduced to civil time. Forwarded by Capt. Biden.*

22d October.—Lat. at noon 12° 12′ N. long. 81° 40′ E. wind N. E. to 6 P. M. and N. by E. to midnight, squally at times with dark threatening weather.

23d October.—2 A. M. wind N. N. E.; day-light to noon increasing to strong gales with dark threatening weather and every appearance of an increasing gale, for which all preparation was made; wind from 8 A. M. to noon marked N. E. by N. No observation. Lat. account 11° 49′ long. account 83° 35′. 8h. strong gales N. by E. At 6 P. M. very heavy, a man washed overboard from the poop, hove to with head to the Eastward. At 10-15, vessel laid on her beam ends with the top-rims in the water, cut away the lower masts, and righted her with 4 feet water in the hold, ballast and cargo shifted, and deck torn up by the fall of the masts, pumps choked, and rudder gone.

24th October.—Day-light still blowing heavily from the S. E. (the wind is marked N. by E. at 1 P. M. of 23d, but afterwards, though the time of change is not marked, it is stated to be at S. S. E.) noon more moderate. No observation. Lat. account 11° 53′ long. 83° 35′ E. 7 P. M. wind S. E. by S. At 10, moderating.

25th October.—Employed making a temporary rudder. This log ends somewhat abruptly, it being only stated that both Chronometers were ruined by salt water. I presume that the other instruments were also rendered useless, and thus no observed latitude or run is given. The positions are thus estimated from the Lat. and Long. given on the 22d, and the subsequent logs.

The LORD ELPHINSTONE.

The *Lord Elphinstone* which left this port on the 16th ultimo for Coringa, encountered a severe gale of wind on the 23d and 24th, in latitude 15° 27′ North and longitude 81° 30′ East, with a heavy sea running the whole time. The Barometer fell to 29.69, which is as low as it fell at this presidency (Madras.) The wind blew from N. N. W.* to East, at which quarter it terminated at 4 A. M. on the 25th. The good ship bore the gale well, having lost neither mast, spar, nor sail. She has since arrived at her destination.—*Madras Paper.*

The foregoing are the Logs of Vessels at sea in the Bay of Bengal. I now give the information from Madras and the Coast, and then the Logs of the Vessels which put to sea from the Roads. The following is an extract of a letter from Capt. Biden:—

Madras, January 3, 1843.

MY DEAR PIDDINGTON,—I had the pleasure to forward you by the *Enterprize* on the 28th ultimo, all the logs which I have collected since our gale of October 24th. I have been so much engaged, that I was prevented sending them sooner as I intended, and having so long delayed the transmission of these valuable records, I would not forego so favorable an opportunity as this per *Hindostan.* One advantage has been gained by the delay; viz. the possession of the *London's* and the *Sarah's* log Capt. Atwood of the *London,* encountered the gale on his passage from this port to Moulmein, and the *Whitby,* which vessel sailed hence with troops for Moulmein on the 16th of October, (the *London* sailed on the 18th,) experienced a perfect hurricane; her sails were blown to shreds, and she lost her quarter boat, bulwarks, and one man washed over board. The commander of the *Whitby* told Captain Atwood, that the wind flew round to the Southward, that his Barometer fell down to 28, and that his vessel was for sometime in a critical situation. He promised to send me a copy of his log, otherwise Capt. Atwood would have obtained minute information; but I am sorry to say, the *Whitby's* log has not reached me. I believe the *Whitby* was about 20 or 30 leagues east of the *London.* As she sailed two days before her, the description of weather the *Whitby* encountered, and her disasters, tally very much with what was experienced by the *Lady Feversham,* and I believe she was not far from the *Feversham* during the gale. I hope the information I have been enabled to gather together, will furnish you with such authentic statements of the extent, duration, and the character of the remarkable storm to which all the logs relate, as can well be collected. I am of opinion that Pondichery was the centrical position by land,* as it blew a complete hurricane there, and was by no means so violent at Negapatam. The log of the *Lady Clifford* details the weather at that southernmost point, and to the Westward of Madras there was no indication of a severe gale. Official and private reports forwarded with the logs shew, that the Barometer did not descend below 29.70, and a rise was visible about 4 P. M. The gale commenced here about 8 A. M. on the 24th, and then the Barometer was at 29.89. We had smart squalls the preceding night, and much rain, and except at intervals from 6 A.M. till about noon, the weather was thick and hazy, with much rain, however, only two vessels remained in the roads after eleven. The *Dauntless* slipped at noon, and the *Emerald* brig, having got down her yards, and riding heavily, cut away her masts at 3 P. M., the sea then making a fair breach over her, with two anchors ahead, from one of which she parted; she rode out the gale. It blew fresh, and at times in hard gusts. The wind was from North to N. by E. till noon, N. N. E. at 2 P. M. and veering from N. N. E. to E. N. E. till 6.

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* NNE is probably meant here.—H. P.

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* The centre passed a little to the north of Pondichery.

At 4-30, the Barometer indicated a rise, when the wind shifted to E. by S. and E. S. E. At 7, the Barometer had risen nearly one-tenth. At 8, it was at 29.84, the wind then S. E. and at 10, the weather cleared up, the moon rose about 10-30, and from that time till midnight we had moderate breezes from S. E. to S. S. E. and fair weather. I kept an anxious look-out on the *Emerald*, saw a light on board of her occasionally, and at 1 A. M. being well satisfied that she was safe, I left my office. You will observe by the logs of the respective vessels which slipped from the roads, how critically several of them were situated; for instance, the *Repulse, General Kyd,* and the *Amelia Mulholland.* I attribute their perilous situation to the want of due attention to those precautions which are laid down in clause 10 of our revised Port Regulations, copy of which I forward you.

The vessels named in the margin,* were wrecked between Covelong and the Seven Pagodas. The Barque *Highlander* lost her rudder, the *Arethusa* and *Ganges* were too light, and were thrown on their beam ends, and it may be said, they literally drove on shore; but I am of opinion that the ship *Frances Smith* might have gained a sufficient offing to insure her safety if sail had been set and carried when she stood to sea; but unfortunately her courses were not bent, which might have been reefed, and carried the whole of the gale, whereas she split her fore topsail about noon, and under a treble reefed main topsail and a trysail, she was little better than lying to, and drifted fast to the Southward. The first cast of the lead at 7 or ½ past 7, shewed the imminent danger of her position, and the accompanying deposition of an able seaman, who was one amongst the number saved from this unfortunate vessel, will shew what followed.

(Signed) C. BIDEN.

The following are the official communications from the Observatory, forwarded by Capt. Biden.

24th October.—At	8 A. M.	Bar.	Wind	N. N. W.
„	10 „	..	..	N. by W.
„	Noon	29.78. ..	..	N. to N. by E.
„	2 P. M.	29.72. ..	..	N. N. E.

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* *Frances Smith, Highlander, Ganges, Ten,* and *Arethusa.*

24th October.—6 P. M.				N. E.
„	7	Blowing hard,		E. N. E.
„	8	„		E.
„	9		29.84.	E. S. E.
„	10	„		S. E.

Observatory, 24th October, 2 P. M.

The Acting Astronomer has the honor to forward to the Master Attendant, the register of the Barometer at this office, in continuation from noon of this day to the present time. He would state for the further information of the Master Attendant, that the Sympiesometer has commenced falling rapidly, and that every indication announces an approaching gale.

	H. M.	
Barometer at	0 30	29.7825.
„	1 0	29·7565.
„	1 30	29.7530.
„	2 0	29.7260.

Observatory, 24th October, 1842.

My dear Sir,—I am happy to tell you, that the Barometer is steadily rising and Sympiesometer also. We have nothing to fear this evening. I think we must look out to-morrow. Barometer at this moment 29.8495. Yours, &c.

(Signed) Henry Taylor

The Acting Astronomer has the honor to inform the Master Attendant, that the Barometer has had a decided tendency to rise from 4 o'clock this afternoon; the results are in continuation from the last report.

Meteorological Journal, from 2 P. M. *to* 9.

1842.	Time.	Barometer.	Wind.
24th October.—	2 0 P. M.	29.7260	N. E.
„	2 30 „	·7105	N. N. E.
„	3 0 „	·7100	N. N. E.
„	3 30 „	·7230	N. E.

24th October.—	4 0	„	29·7045	N. E. by E.
„	4 30	„	·7185	E. N. E.
„	5 0	„	·7390	E. S. E.
„	5 30	„	·7565	E. by S.
„	6 0	„	·7565	E. by S.
„	6 30	„	·7760	S. E.
„	7 0	„	·7995	S. E.
„	7 30	„	·8225	S. E.
„	8 0	„	·8400	S. E.
„	8 30	„	·8495	S. E.
„	9 0	„	·8525	S. E.

The late results shew a tendency to continued rising in the Barometer, the Sympiesometer is also rising, so that in all probability the worst of the gale has appeared for this night; at all events upon Col. Reid's Theory, the return of the gale may be felt before to-morrow.* The Acting Astronomer has made arrangements for a register to be kept throughout the night.

Abridged Report of Logs of vessels in Madras Roads, forwarded by Capt. Biden.

Brig COLUMBINE, *Capt. Crisp, Madras Roads.*

24th October, 1842.—P. M. strong gales, and a heavy sea running from the N. E., by midnight heavy squalls with rain. Wind N. E. At 4 A. M. ditto weather. At 7 A. M. close reefed the top sails, and double reefed the main trysail, and cleared the decks for sea. At 8 A. M. ditto weather. At 9-30 A. M. tremendous heavy squalls with rain, and having every appearance of a gale, slipped the chain at the 75th fathom shackle, and stood out to sea under the close reefed topsails and fore-top-mast staysail; most of the other vessels in the roads having slipped likewise. Wind N. E. At noon ditto weather with a heavy sea, the ship labouring much, and shipping a quantity of water on deck.

P. M. Commences with hard gales, and a heavy sea with tremendous squalls. At 2 P. M. wind E. N. E. At 4 P. M. wind East. At 8-30 P. M. the wind having gradually veered round to the

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* So in MSS.

S. E. wore ship to the N. E. in 18 fathoms water, saw a blue light burning to the S. W. Midnight more moderate.

25th October.—At 4 A. M. made some sail, and stood in for the land. Noon light winds and passing showers. Latitude observations 12° 37′ North; after this time fine weather.

Report of the Barque SYMMETRY, *Capt. F. D. Butler.*

24th October.—At 9 A. M. blowing a heavy gale at N. by W., I slipped from my anchor and steered an East course until 2 P. M. wind continuing at North, and N. N. W. At 3 P. M. the wind shifted to N. E. blowing at times a perfect hurricane, altered course to S. E. A high sea running, ship laboring much. At 5 P. M. the wind in a heavy gust came from the East, and continued its violence, until 6-15 P. M., when it gradually abated, and drew to the S. E., continued on the starboard tack until 7-30 P. M. Wore ship then in sixteen and a half fathoms of water, and made more sail, rain descending in torrents. At 9 P. M. the wind veering more Southwardly, stood East until 6 A. M. then fine weather. Longitude by Chronometer 62° 42′ E. latitude 12° 42′. Wind South, experiencing a current of 3½ to 4 mile per hour to the Southward, and from which date until my arrival in the Roads experienced fine weather.

Barometer 3 P. M. 29.60. and 29.10.

F. D. BUTLER,
Commander, Symmetry.

28th October, 1832.

Report of the Ship NEPTUNE.

24th October.—The gale commenced with rain and very thick weather. At 10 A. M. slipt. At noon, gale increasing, obliged to furl the fore-sail, then under close reefed main topsail, blowing terrifically, head then about S. E., and by S. making no head way, and gradually breaking off. At 4 P. M. it cleared a little, found the *General Kyd* and a brig close to us; At 6 P. M. ship's head off to S. S. W. wore ship immediately. At 9 P. M. saw the land astern supposed to be off Covelong; it appeared very near us, I immediately made sail to get her off the land, ship's head then about E. N. E. At 11 P. M. fortunately it moderated, and the ship came up to E. Midnight out of sight of land. Tuesday A. M. weather moderating and looking much fairer. At 1-30, made a little sail, at day-light moderate. Barometer and Sympiesometer standing 29.40, *it was no lower in the extreme of the gale,* continued to stand off E. and by N. At 8 A. M. fine weather. 9 A. M. atmosphere hazy, hot and sultry. At noon a light steady breeze from the Southward, found myself thirty-one miles E. of Madras, and seventeen miles to the Southward.

(Signed) W. F. KNIGHT,
Chief Officer, Ship Neptune.

Abstract of Log of the AMELIA MULHOLLAND.

23d October.—At noon the Barometer stood at 29.70, (never having been higher since lying here but one day, when it rose to 29.80,) the weather at this time bearing a threatening aspect, blowing a strong breeze from North; hauled all the cable on deck, veered to 82 fathoms, and saw all clear for slipping; the Bar. falling towards evening to 29.60, the wind increasing towards midnight with heavy squalls and rain to heavy swell setting in from the N. E., making the ship roll heavy.

24th October.—Commenced with strong winds and rain, with heavy puffs. At 5 A. M. the cable parted at 54 fathoms, the ship canting to the Eastward, made sail and stood out East, the wind increasing to a hard gale. At 10 A. M. the wind Eastering and the sea making fast, the ship laying off E. S. E. At 11, set the fore-top staysail to reach her off as much as possible. At noon it blew a hard gale with a tremendous sea, the Barometer down to 29.30, it having rained without intermission the whole morning.

Longitude 80° 38′ East, latitude 12° 46′ N. by account. At 1-30 P. M. it blew a hurricane, the ship lurching heavy, shifted the (shot and shell) ballast which gave her a tremendous list, making the ship quite unmanageable, carrying the helm hard a weather, the fore-topmast staysail split to pieces, and finding it impossible to take in the main trysail, sent the hands aloft, and cut it down from the gaff, bent another fore-topmast staysail, the gale moderating towards sun-set. The

Barometer inclining to rise. At 5 P. M. sounded in 28 fathoms, set the fore-top staysail to wear ship, but she would not pay off, sent the hands below to trim her, but the ship was labouring so heavy that very little was done. At 6-30, shoaling our water fast, set the reefed fore course, and tried to wear again, but this had no effect, sent the hands below again to trim over more shot. At 8, the gale having greatly moderated and the sea falling, set the double reefed fore-top-sail, but it had no effect, the ship still carrying the helm hard a weather; the water having shoaled to 15 fathoms, clewed up the head sails and brought up.. At 9 P. M. in 10 fathoms veered cable to 60 fathoms and stowed sails, the gale moderating fast. Midnight moderate and cloudy; the Barometer having rose to 29.60, after which she had fine weather.

25th October.—Commenced moderate and fine, with a light breeze from the S. Eastward. At day-light found ourselves off the land about three or four miles, Sadras Hills bearing West.

Log of the Ship REPULSE.

The *Repulse* was lying in Madras roads, and at 8 A. M. slipped and put to sea, the wind marked N. N. E., course East. At 10, wind N. E. by E. Noon increasing. At 1 P. M. wind S. E. At 8 P. M. moderating, anchored in 19 fathoms. This ship's Barometer is marked as follows:—

At 8 A. M.	29.60
10 ,,	29.29
4 P. M.	29.27
6 ,,	29.29
8 ,,	29.35
10 ,,	29.38
12 ,,	29.50

When the weather cleared up the centre of the Sadras hills bore N. W. by N.; she returned safely to Madras.

Log of the Ship PRINCESS ROYAL, *Capt. C. J. Lorck.*

The *Princess Royal* slipped and put to sea at 9-30 A. M. with a gale at N. ½ E. at 6 A. M. and North varying to the Eastward in squalls when she slipped. She stood out to the Eastward of course, and at

Noon had the wind N. N. E. gradually hauling round to E. by S. At 5. P. M. varying to the South in the squalls to S. E. At 6½ Barometer marked at 29.40. This ship did not anchor, and returned safely to Madras.

Ship LADY CLIFFORD, *Capt. Miller.*

The *Lady Clifford* was at anchor off Nagore in latitude, 10° 48′ N. and Capt. Miller, says in a letter to Capt. Biden:—

"By the accompanying extract from the log book of my vessel you will perceive, that the late gale, as far as it came under my observation, had all the characteristics of a circular storm, and that I skirted the South and S. E. range of it, at least I acted upon that supposition, and the result serves to confirm the opinion. It is probable, that I escaped much of its violence by not approaching too near to the centre of the storm, which I imagine must have been to the Northward of my position, and had I been bound to the Southward, I might possibly have avoided it altogether by steering to the S. W. instead of the N. E.

"If these great storms are regulated by a fixed law, the knowledge of it might be of infinite advantage to seamen, by enabling us to make the best of them, instead of being perplexed by the sudden changes and other phenomena, so much against the good management of a ship during their violence."

I have inserted the log of this vessel without abridgement, as shewing how judiciously Captain Miller profited by his knowledge of the Law of Storms.

Extract of the Log Book of the LADY CLIFFORD.

23d October.—At anchor at Nagore. During this day it blew a fresh gale at North, the sky clear, and weather fine. Barometer 30.05. Towards evening a thick cloud or bank gathered in the N. E., and a long swell set in from that quarter. At 10 P. M. the whole sky was overcast, and the Barometer began to fall. At midnight the wind decreased, and drew round to the N. W. the swell from the N. E. still increasing, sky overcast, but not looking bad. Barometer 29.90.

H.	K.	Course.	Wind.	Bar.
1	..	... ...	...	29.90
2	...	... ...	...	29.85
3	...	... ...	...	...
4	...	... ...	...	...
5	...	... ...	...	...
6	...	... ...	...	29.85
7	.	... ...	...	...
8	3	N. N. E.	W.N.W.	...
9	4	N.E. by N	...	...
10	5	... ...	...	30.00
11	6	N. E.	West	...
12	7	... ...	W. S. W.	30.00
1	8	... ...	... ...	...
2	8	... ..	S. W.	...
3	7	... ...	S W.	...
4	7	... ...	...	...
5	7	N.E. by N.	...	29.70
6	7	... ...	S. S. W.	...
7	7	N. N. E.	...	...
8	7	... ...	South	...
9	7	... ...	...	29.80
10	7	... ...	S. S. E.	...
11	7	... ...	...	...
12	7	... ...	S. E.	29.90

24th October.—A. M. light wind from the land, sky overcast but fine. Barometer falling. Day-light same weather, cloudy but fair appearance, excepting the thick banks in the N. E. which grew longer and darker, and the N. E. swell still increased; not liking the appearance of the weather, weighed at 7 A. M. and stood to sea. Barometer began to rise, wind freshening at Westward. At 10, wind increasing to a gale, reefed the sails, and made the ship snug, pitched away the jib-boom, split main sail and carried away main topmast-stay. Noon it blew a whole gale, W. S. W. and a drizzling rain commenced, weather looking stormy, but Barometer still high. 4 P. M. gale very severe, could just steer before it with difficulty under close reefed topsails, sheeted *half home,* courses furled, topgallant masts on deck. 6 P. M. the rain ceased, the sky broke into clouds, and Barometer began to rise. At 8, less wind, sky clearing. Midnight wind abating fast, out close reefs and set foresail, weather looking fine.

25th October.—Day-light fine weather, made all sail, &c. At noon in latitude 11° 9′ N. longitude 80° 20′ E. At Madras, latitude 12° 20′ N. longitude 80° 55′ E. Anchored in Madras Roads, at 6 P. M. on the 26th.

Abridged Report of the Ship GENERAL KYD. *Forwarded by Captain Biden.*

24th October.—At 8-30 A. M. blowing fresh from the Northward with heavy swell rolling in, and the Barometer being at 29.60, deemed it advisable to slip and stand out to sea. 9 A. M. slipt and stood to the Eastward under double reefed topsails. 9-45 breeze increasing fast. Barometer 29.54, close reefed topsails, wind N. Eastward, ship stands S. E. by E. Sails blowing to pieces, ship lying over much; lee gangway under water; stove in all the butts of water on lee side, and hove spare staves and cotton off orlop deck, into the hold. Barometer 29.49. Soon finding the gale increasing fast, tried to heave the lee carronades overboard, but could not succeed. 12-30, in a tremendous squall, washed lee cutter away, battened hatches down. Water nearly up to main hatch coombings. Barometer 29.44. Sea terrific at 2 P. M. and ship drifting bodily to leeward; at 4 sounded 25 fathoms; attempted again to bend main-topsail without success, but bent the third stay-sail; wind E. S. E. ship heading S. by W. At 5 P. M. gale tremendous, and ship off to S. S. W. water 17 fathoms. Finding that we were drifting fast on shore, called hands aft, and stated that the only chance we had of our lives was to wear ship, at the same time telling them, that it would be no use doing so unless we got the main-topsail on her; the men with one consent said they would do their utmost, and with God's mercy we brought the sail to the yard after wearing ship. At 5-30 by 11 o'clock, the same night the least water at this time 15 fathoms; at 12 o'clock gale moderated and depth of water 18 fathoms; at 1 o'clock, 19 fathoms; at 2 o'clock, 20 fathoms; at day-light fresh breeze at S. Eastward, stood to the Northward out all reefs, and set courses. The Barometer 12 o'clock was 29.43; saw the land about Sadras.

THOMAS T. FEAD, *Chief Officer,*
Ship General Kyd.

Abridged Log of the American Ship FRANKLIN, *Captain Richard, reduced to civil time. From Captain Biden.*

24th October.—The *Franklin* slipped and put to sea at 8 A. M., the wind at 9 A. M. marked N. by W. At 2 P. M. N. E., heavy gale throughout. At 7 P. M. wind E. S. E. and at 11 E. S. E.

25th October.—At 2 A. M. wind S. S. E. and moderating to noon, when latitude 12° 13′ N. out of sight of land; she arrived safe in Madras roads with very little damage.

Abridged Log of the Ship DAUNTLESS, *reduced to civil time. From Captain Biden.*

24th October.—Lying in Madras roads. At noon heavy gale *veering from N. to N. N. E.* with thick hazy weather. Slipped and stood to sea. Thermometer 80°. Barometer 29.40. P. M. wind

N. N. E., N. E., and East, at 4 P. M. in a tremendous heavy squall with rain. Thermometer 78. Barometer 29.30. At 6 wind, S. E. by S. ½ S. veering to S. E. At 10, S. E. strong gale. At midnight decreasing. Barometer 29.40.

25th October.—Moderating from midnight. At noon latitude 13° 00′ N. longitude 80° 30′ East. Thermometer 84. Barometer 29.50. She returned safely to Madras Roads.

Abridged Log of the Barque MERMAID, *reduced to civil time. From Captain Biden.*

24th October.—Slipped and put to sea at 7. A. M. Wind at 7 North; at 8 N. N. E.; at noon N. E. by N; at 6 P. M. E. by N. veering S. E.; and Southerly by midnight, when clearing up. Barometer from 29.80; at 1. A. M. to 29.50; from 8 A. M. to 5 P. M. and 29.75 at midnight again.

Brig ARETHUSA.

From the declaration of the Chief Officer, forwarded by Captain Biden, it appears that she put to sea at 9 A. M. standing to the E. S. E. for 6 hours, when the wind "shifted suddenly in a heavy squall to the Eastward," throwing the vessel on her beam-ends. The masts were cut away, and the vessel anchored in 7 fathoms, but the surf carried her on shore, when she was wrecked.

The FRANCES SMITH *and Brig* RUBY.

The *Frances Smith* put to sea, but appears either to have been too crank, or leewardly, or not to have carried sufficient sail to obtain an offing, and she was driven on shore and wrecked. The brig *Ruby*, a coasting craft, was also wrecked to the Northward of Madras.

From Pondicherry.

Captain Biden forwards me from this port several reports from residents, which I have printed below, and an official declaration before Captain Hostein, the Master Attendant of that port, relative to the loss of the *Antoinette*, Captain Prudhomme, and other vessels.

Reports from Pondicherry.

24th October.—The day the gale took place, the Barometer which had fallen on the previous day, rose at 8 o'clock to 28 inches and 2 lines. F (or 30.05 Eng.) At ½ past 9 o'clock, it began again to fall gradually until noon, when it was at 28 inches, 0 lines, and 8 points (or 29.90 Eng). It continued to fall, and at 2 o'clock, at which hour a signal was made for vessels to get ready to put to sea, the Barometer was at 27 inches and 10 lines; (29.80 E) still falling, at 3 o'clock the wind was very strong, the sudden gusts becoming very fierce; the Barometer having somewhat further fallen. At a ¼ before 4 o'clock, the gale was blowing from N. E. to W. until 20 minutes past 5 o'clock. The Barometer was then at 27 inches and 2 lines, (29.15) when suddenly the wind became lulled until 6 o'clock, but afterwards it blew fresh from the S. W. During the calm, the Barometer fell below *storm,* but rose again in the evening.

Second Report.

24th October.—The Barometer had fallen to 26 inches and 10 lines, (28.65 E) two lines below *storm,* and remained thus from 20 minutes past 5 o'clock until 6, when the wind began again to blow strong from the S. W.

On the 2d instant, the Barometer was at 28 inches and 3 lines (30.1 E).

During the gale, the Barometer fell half an inch below what it did in the gale of 1830, and was stronger than any I remember in these parts.

It is to be remarked, that from 2 to 5 o'clock in the afternoon, at the most violent part of the storm, *the oscillations of the mercury* in the Barometer were so apparent, that it rose and fell instantaneously 2 to 3 lines, as though somebody had shaken the Barometer.*

It appears from the reports received, that the storm reached to the W. to the distance of 75 miles, consequently from 70 to 80 leagues from W. to E., for Captain Thevenard was not at the limit of the storm when he felt it, at 40 leagues to the East.

From S. to N. the storm does not appear to have made so large a zone, as it was not felt further than Porto Novo.†

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* Italics are mine.

† This is an error, as it was distinctly felt at Nagore, a degree farther South.—H. P.

This gale in its course, was contrary to what it is generally; the wind blows from the N. W., flies round to the N. E. in passing by the N., and then to the E. and the S. This time the wind flew to the S. and S. E. in passing by the S. W. and it remained many days from the S. not strong, but the drops of rain were very large.*

Certificate from the Master Attendant of Pondicherry.

" I, the undersigned do declare and certify, that the English bark *Antoinette,* Captain Prudhomme, arriving from Cochin and Tranquebar with a part of her cargo on board, anchored in the roads of Pondicherry on the 2d of October last."

On the 23d of the same month, in the afternoon, the Captain was on shore, and the weather having assumed a bad appearance, the surf became so high that communications with the roads were interrupted. *On the morning of the 24th the Barometer had risen,*† and we thought that the weather had settled; nevertheless the surf was always very high, and Masula boats could not go through it.

There were in the roads, the English barques *Antoinette* and *Appollon,* the English brig *Cervantes,* the French brig *Le Mirabeau,* and the Dutch barque *Corsair.*

At 10 A. M. the Barometer began to fall, the wind was blowing moderately by squalls from N. W. to W. N. W. It was raining in the squalls. At noon the wind blew harder, the Barometer always falling. At half-past 12 o'clock the Dutch barque *Corsair* which was to windward of the *Antoinette,* dragged her anchor, and seemed to fall athwart the hawse of the *Antoinette.* The rain which was then falling in great abundance, though the wind was not very strong, hindered us from seeing both ships, which after having appeared a moment together, separated themselves, and the *Corsair* had anchored on the larboard side of the *Antoinette* at a small distance. At 2 P. M. I made signals to the ships to get under weigh immediately. The sea was very high in the roads, and the ships pitched a great deal at anchor. From half-past 1 o'clock P. M., it rained so heavily, that not a single ship could be seen, the wind was always from the same direction, and blew by squalls very strongly. The Barometer was always falling. At 4 o'clock P. M. a most violent hurricane had set in, the flagstaff and the trees which were in the streets of the town were broken and torn up by the whirlwind. At 20 minutes past 5 P. M., the wind from the N. W. to W. N. W. ceased on a sudden, and after a moment of calm, the hurricane began with a new violence from the S. W. to the South.

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* This, it will be seen, depends upon the storm passing to the North or South of the observer, as also upon its track.

† Italics are mine.—H. P.

When the wind came round to the S. E. it began to abate, it was then 9 o'clock P. M., and during the night the wind became very moderate.

On the morning of the 25th, the weather became pretty fair and the sea was not high; the Brig *Cervantes* was recognized anchored six miles to the N. E. of Pondicherry, having only her lower masts standing; the Captain went immediately on board, and when he returned, he told me that his Chief Officer gave him the following report: The *Corsair* in dragging her anchor ran foul of the *Antoinette*, and carried away her bowsprit, and a little while after both of her topmasts went. Afterwards when both ships had separated, the *Antoinette* ran foul of the *Corsair*. Both ships seemed much to injure each other, for the sea was very high.

Of the five ships above named, two only came back into the roads, the *Cervantes*, and the *Mirabeau* which appeared on the morning of the 26th, having lost her main-mast, which the Chief Mate has been forced to cut away in order to lighten the ship, which was on her beam ends.

Having learnt that pieces of wreck had come ashore at about 12 miles to the North of Pondicherry, I informed the Captains of the five ships of it. Captain Prudhomme having gone to the place where these wrecks were lying, recognized amongst them several pieces belonging to the *Antoinette*.

These numerous wrecks which confirm the report made by the Chief Mate and crew of the *Cervantes*, leave no doubt of the loss of the *Antoinette*, which had on board the Chief Mate and a crew of 24 men; as well as her cargo, which was almost complete. The lower part of the mizen-mast of the *Corsair* having come ashore, we must suppose that those ships have foundered in consequence of the injuries received when fouling each other. Since the hurricane, the breeze has constantly ranged at first from the S. E. and afterwards from the N. E., which would have brought them into the roads if they had been afloat. The hurricane of the 24th October extended itself to a great distance from Pondicherry, and on the same day ships have been dismasted at 200 miles to the east of Pondicherry, while five ships from Madras roads came on shore in the neighbourhood of that port.

(Signed) A. HOSTEIN,
Pondicherry, 1st December, 1842. *Master Attendant.*
(A true Copy.)
(Signed) A. PRUDHOMME.

Storm at Pondicherry.

We are indebted to a correspondent at Pondicherry for a detailed notice of the storm of the 24th ultimo, as experienced in the vicinity of that town, from which we extract the following particulars: On the 23d the Barometer at 6 A. M. stood at 30 inches, but its fall during the day indicated an approaching storm. At 6 P. M. the sea was very rough, and during the night the waves rose to a great height. At 7 on the morning of the 24th, the raging of the sea was terrible. The sky was overcast with heavy clouds, especially in the North-East and North-West. At 8 A. M. the Barometer had fallen to about 29 inches, apparently indicating a hurricane. The surf was extremely violent, the waves breaking over the vessels, and at 8½ heavy rain commenced falling, and the wind set in from the North-West, both gradually increasing in violence as the day proceeded. The Barometer continued falling till 6 in the evening, the wind varying from North-West to South-West; about this hour there was a short period of calm, when the wind suddenly shifted round to the South and South-East, blowing from this quarter with as much fury as it had previously done from the opposite one. At 9 P. M. the wind moderated, and it gradually became calm. From 10 A. M. to 9 P. M., the rain fell in torrents, without ceasing. At the moment that the storm suddenly shifted to the South and South-East, the Barometer had attained its lowest point of depression, the mercury having fallen to 28 inches, or "stormy," being half an inch lower than it has been observed since the storm of 1830. It was at 8½ P. M. that the mercury began to rise again.

In the morning, the following vessels were in the Roads: *Cervantes, L'Appollon, L'Antoinette, Le Mirabeau,* and *Le Corsair.* They put out to sea at 2 P. M. on cannon being fired as signals from the port. The *Mirabeau* and *Cervantes* returned with loss of masts and other damage, but the *Appollon, Antoinette,* and *Corsair* had not made their appearance, and great fears were entertained for their safety. The ship *Nouveau Tropique,* which had left two days previous for Madras, regained the Pondicherry Roads with much damage. The officers of the vessels which returned, reported that they had never witnessed so severe a storm ; its ravages are described as extending inland for 18 or 20 leagues ; in Pondicherry itself many houses were damaged, and two lofty chimneys of the manufactory of Messrs. Fontain and Co., 100 feet in height, were thrown down by the storm.

Coupling the above interesting particulars of our Pondicherry correspondent with the appearance of the storm here, where it was much less violent, and at Cuddalore, where a former correspondent seems to have conjectured very rightly, they had "but the tail of it ;" the probable loss at sea of *three* vessels off Pondicherry, and the known wrecks of *five* near Sadras, with other casualties to the South, we are much inclined to arrive at the conclusion that the storm of the 24th ultimo was a true rotatory hurricane, whose centre or vortex was somewhere out at sea, between the latitudes of Pondicherry and Sadras—a conclusion to which we invite the attention of our scientific readers. We may add, that at Madras the wind at 10 A. M. was North and continued in this quarter till 2 or 3 P. M. At 4 P. M. it was N. E. by E. At 8 P. M. had moderated considerably. At 10 P. M. had shifted round to the South-East, and during the night became calm.—*Madras Spectator, Nov.* 5.

The Madras *Athenæum* furnishes the following further particulars of the late gale :—

"The following statement from the Master Attendant, details further mischief occasioned by the recent gale.

Intelligence from Porto Novo.

"*24th October.*—Brig *George* came ashore, fresh gales from the N. W.; 6 P. M. shifted to S. W.; midnight wind due South, much moderated; 3 A. M. 25th, fresh Southerly and S. W. breeze, with occasional heavy gusts."

Having addressed Captain Campbell, Assistant Surveyor General, Southern India, to request that he would assist me in procuring such information as he could obtain to assist in tracing the storm inland, he has obligingly sent me in addition to his official report, those mentioned in the following extracts from his private letter :—

Ryacottah, 8th March, 1843.

" Ryacottah is in latitude 12° 31′ 20″ N. longitude 78° 4′ 44″ E. and by elevation is about 3145 feet above the sea, as deduced from the data of Col. Lambton's Survey.

I send you a set of observations with the Barometer made at Bangalore by Mr. Garrett, with the same instrument as before, he only remarks on the 25th, " Rain and tremendous wind at night." These observations with both instruments are merely corrected for the peculiarities of the instruments.

The former observations were reduced to 32°, for an expansion of 0.0180018 feet for each inch of mercury, and for 180° of temperature according to Dulong and Petit.

I enclose also some observations made by Lieut. Robertson, Superintendent of Roads near Patcheeroopum in the Amboor valley, which place you will find in the 78th sheet of the Indian Atlas, to be about 34 miles S. by W. of Vellore.

I conceive the reason of the strength of the storm not being felt there arises from some high precipitous hills which shelter the plain of observation.* The instrument is a very fine one, but I do not know if it has been compared.

10th March.—I have this morning received from Capt. J. Green, the Superintending Engineer at Bangalore, a splendid draft of the storm, taken with Newmann's self-registring machine. You will see that there, as here, it began at North, but shifted to the West, in which direction and S. W. it was at its height from 12 to 2 of the night of the 24th. The pressure is I suppose pounds on a square foot. The wind then came back to North again at 10 A. M. of the 25th, and then to South suddenly at a quarter before 1 of the 25th, and at 5 P. M. shifted to East.

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* I have no doubt this was the true reason, and that it might, as in the case of Gyah and Pooah, in my Seventh Memoir, Vol. XI, Jan. 8, have been *seen* overhead.—H. P.

October.	Bangalore.		Ryacottah.	Difference.
12	27.231	At 10 A. M.	27.219	—.012
13	27.215		27.183	—.032
14	—.223		—.191	—.032
15	—.178		—.153	—.025
16	—.180		—.137	—.043
17	—.176		—.139	—.037
18	—.133		......	......
19	—.137		27.119	—.018
20	—.149		......	......
21	27.160		27.099	—.061
22	—.166		—.101	—.065
23	—.162		—.087	—.075
24	—.119		—.035	—.084
25	26.972		26.961	—.021
26	27.033		27.029	—.004
27	—.052		......	......
28	—.158		27.059	—.099
29	—.125		—.119	—.006
30	—.127		—.129	—.002
31	—.125		—.109	—.016
24th—4m.	26.972		26.939	—.033

The following Report has been kindly forwarded to me by the Magistrate of Mangalore.

Your letter of the 16th April, addressed to the Magistrate of Honore, reached me a short time ago. I have now the pleasure to send you some notes of the weather, from the 24th to the 27th October, 1842, kept in my office. The direction of the wind is probably not exactly correct, as there is no vane at the station.

The appearance of the sky was very disturbed on the 25th and 26th, and I felt certain, that a severe gale of wind must have been blowing on the opposite side of the Peninsula.

Notes of the Weather at Mangalore in October, 1842.

24th.—Heavy rain

25th.—Light showers with strong gusts of wind from the N. W... .. .. . } Thermometer maximum 75°.

26th.—Cloudy, light showers, strong southerly winds.

27th.—Ditto ditto.

HENRY BLAIR,
Magistrate.

Abridged Report from the French settlement of Mahé.

Desirous of obtaining information from every possible point along the coast, I addressed M. Bourgoin, the Governor of the French settlement of Mahé, requesting he would kindly collect for me all that could be gleaned there. The substance of his letter in reply is, that there were no regular observations registered by any person at that settlement, nor at Karical; but that towards the close of October 1842, no person recollects any particular bad weather, or such signs of it as might have indicated that a storm was raging elsewhere, and this is corroborated by those, who from time to time keep detached notes of remarkable changes. At Mahé, between the 23rd and 27th October 1842, nothing of note occurred in the appearance of the weather, or of the sea at Karical. The rains began on the 22nd October, but without any wind worth noting: the surf only was rather high.

Observations from Patcheeroopum in the Amboor Valley, about 34 *miles S. by W. of Vellore, or about Latitude* 12° 22′ *N. Longitude* 79° 6′ *E., and bearing from Madras about S. W. by W.* 85 *miles, by Lieutenant Robertson of the Madras Army. Forwarded by Captain Campbell, Assistant Surveyor General.*

24th October.—8 A. M. Thermometer 73°. Barometer 28.798. Rain guage $\frac{27}{10}$ inches, wind N. E. with drizzling rain throughout the day. Squally at night.

		Ther.	Bar.	Rain Guage.	Remarks.
25th Oct.—	7 A. M.	73°	28.876		Cloudy, wind moderate.
,,	12 A. M.	75°	28.912	$\frac{2}{10}$	Ditto ditto.
,,	3 A. M.	75¼°	28.886		Ditto ditto.

	Ther.	Bar.	Rain Guage.	Remarks.
26th Oct.— 7 A. M.	73°	28.936		Cloudy, with light wind.
„ 10 A. M.	74°	28.944		Ditto ditto.
„ 12 P. M.	77°	28.914		Ditto ditto.
„ 3 P. M.	78°	28.904		Ditto ditto.
„ 8½ P. M.	76°	28.944		Ditto ditto.

Official Report by Captain J. Campbell, Assistant Surveyor General.

1.—From the end of September, the Barometer was observed to have gradually risen daily, which in this situation generally indicates approaching rainy weather, and accordingly on the night of the 12th October, a fall of 2.4 inches of rain took place, the Barometer standing at 27.095 inches, having risen from 26.862 inches on the 28th September: both observations being made at 10 A. M.

2.—From the 12th October, the Barometer gradually fell again until at 10 A. M. on the 23rd October it stood at 26.971 inches, when there was but little wind, clear blue sky and Cirri; but before noon, the wind had increased from N. E. bringing with it moist air which gradually condensed in Cirro Cumuli, and then Nimbi. In the evening the wind had lulled again, but in the night it again increased in strength; and at sunrise of the 24th, was blowing strong at N. E. with an overcast sky, but no signs of rain. At 10 A. M. the Barometer stood at 26.927 inch, with the wind falling again, and a little drizzling rain. At 4 P. M. the wind was high at North with drizzling rain. Barometer 26.820 inches. About 7 P. M. after dark, wind began to increase with rain from North; and between 8 and 9 o'clock, had become strong enough to blow in some cracked panes of glass in a window in an exposed situation. Observations of Barometers forgotten in the confusion of securing doors and windows for the evidently approaching gale.

3.—Early in the morning of the 25th October, the Barometer stood at

1½ A. M. 26.648 inches, gale at its height from the North. Tiles from the houses beginning to fly. Little rain, sky overcast. Thick in East and South; in North an uncommon light in horizon, as if shining under an arch in a canopy of mist about 2° in altitude above the horizon.

3½ A. M. 26.636 inches. Wind at East, many tiles blown off houses on North and East sides. Dark in North. The uncommon light in East. Thick in South and misty with rain.

6½ A. M. 267.40 inches, wind veered to S. E. lulling a little, rain heavy.

7 A. M. 26.778 inches.

7½ A. M. 26.788 inches.

8 A. M. 26.812 inches, wind at South, much fallen.

9 A. M. 26.832 inches, wind very much fallen, but still high, mist and drizzling rain, wind seemed veering Westerly.

9½ A. M. 26.854 inches, wind a strong breeze, mist, no rain.

10 A. M. 26.864, wind strong at S. E. fog and mist.

11 A. M. Fog risen and a little sunshine; air particularly clear, wind light.

4 P. M. 26.793, overcast sky, wind high, rain about in showers. Barometer observations discontinued. The minimum pressure observed by two instruments. The observations given are corrected and reduced to 32° Farhenheit. Instruments the same as last report.

4.—On the 26th October, the Barometer stood 10 A. M. 26.932 inches, morning misty and wet, wind fallen rapidly, blowing as usual from N. E.

4 P. M. 26.839, Blue sky, Cumuli and Nimbi.

5.—After the 26th, the Barometer rose again as gradually as it fell. It must be remembered, that however easy it may be to the practiced seaman to note on the sea shore, or in flat country, the direction of the wind; yet among the vast granitic mountain masses of a country like this, it is by no means easy to tell with certainty, even within 3 points, from which quarter the wind is blowing: its direction being as often *up and down* as any other.

J. Campbell,
Ryacottah, 9th January, 1843. *Asst. Surveyor General.*

Captain Newbold of the M. N. I., Assistant Commissioner at Kurnool, has favoured me with observations from Bangalore, Bellary, and Hydrabad, and with some suggestions of his own, of which I shall avail myself at length in the Summary, which as usual, will follow the detail of the observations. From the notes forwarded by Captain Newbold, it would seem that at Hydrabad, nothing of note was experienced. At Bellary, latitude about 15° 6′ N. longitude 77° 5′ E. the Barometer fell from the 23rd October to the 27th, from 28.65 to 28.55* (height of the station above Madras not given,) and by the 29th had risen again to 28.65. The weather cloudy at times, and the winds from N. to NE. and NW. to the 25th, and then for four days from the SE., but the weather quite fine. At Bangalore on the 25th October, a good deal of wind and rain, almost a storm, the direction not noted. This we have from Capt. Green's observation, as forwarded by Capt. Campbell, and mentioned in the extracts of his letter, page 366.

The following Notes are extracted from a second letter from Capt. Newbold, who has also obliged me with some views, which will be found at length in the Summary.

Since my last, answers have come to my queries from the Southward, decisive of the truth of my supposition of the current's having passed over the peninsula in an easterly direction, to the great gap of Coimbatore, thus bursting through the lofty ghaut barrier upon the Arabian Sea and islets immediately opposite. It was felt severely at Salem, 11° 41′ N. Lat. blowing from the N. E. right in the direction of the gap, and clearly proving the Southerly direction imparted to part of this Easterly blast by the contour of the hilly barrier.

At Madura, 9° 57′ N. Lat. or 1° 44′ South of Salem, the storm was not felt in the least, nor at Paumban 9° 18′ N. Lat. on the coast, where the weather on the 4th and 5th October rather finer than it had been. On the 5th, wind from S. W., fresh breeze with lightning from N. W. from 7 to 11 P. M., and wind from same quarter on the 6th October; wind a little stronger and from same quarter, and a little thunder and lightning at the same hour. On the 7th, the wind was light, thunder and lightning as before. No barometrical remarks made. Those of the Thermometer have nothing worthy of remark.

It is evident, therefore, that the storm did not extend so far South down the coast as Paumban, and from its not being felt at Madura, probably not so far as Point Calymere.

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* See in following page the observations from Bombay.

For the information condensed above, I am indebted to Mr. Fischer, and Messrs. Cadenhead of Salem, Dr. Gill of Madura, and Lieut. Robertson at Paumban.

From F. H. CROZIER, *Esq. Sub-Collector, Malabar, I have received the following letter and report.*

DEAR SIR,—With reference to your letter of the 16th date, I have the pleasure to enclose the remarks entered on the records of the Master Attendant's Office at Tellichery, and regret being unable to procure you more particular observation of the appearances and variation of the Barometer, &c. during the period you specify. I at the time alluded to, happened to be officially engaged, about 25 miles to the North of Tellichery on the coast, and immediately in the rear of Mount Dilly, a lofty hill, as you are aware, projecting into the sea, and forming almost the only safe anchorage and harbour during bad weather on this coast. I remarked at the time that it was *most unusually* filled with Pattamars, (the craft of the coast,) and was given to understand they sought refuge from the bad weather at sea and on the coast. The sky looked very stormy at the time, but I do not recollect any intimation of the vicinity of a gale further than being prevented myself, on the 29th of October, from crossing, as I am accustomed to do, the Bar at the entrance of the Cavery river close to Mount Dilly, by the extreme violence of the surf. I had crossed the Bar a few days earlier in the month. I was detained for two or three days after and before the 29th.

Yours obediently,
F. H. CROZIER,
Sub-Collector, Malabar.

Malabar, 6th May, 1843.

Date.	*Winds during the past Week.*	*Weather during the past Week.*
	October 1842.	Tellicherry.
23rd	Light breezes, the Westward, ...	Fine during the day, towards evening squally over the land.
"	Light breezes variable, N. W. to S. W., and S. E. during the night, ..	Cloudy, with lightning at intervals.
24th	Light land and sea breezes, ...	Fine during the day, towards evening squally over the land.
"	Light breezes variable, N. W. to S. W., and S. E. during the night, ..	Cloudy, with thunder, lightning and slight showers at intervals.
25th	Moderate breezes, the Westward during the day, ...	Cloudy, with drizzling rain.
"	Strong breezes, the S. W. during the night	Cloudy, with lightning and slight showers at times.
26th	Strong breezes variable, S. E. to South during the day, ...	Cloudy, with slight rain.
"	Strong breezes, the S. W. during the night, ...	Cloudy, with drizzling rain.
27th	Fresh breezes, S. W. during the day, ..	Cloudy.
"	Fresh breezes, S. W. during the night....	Cloudy, with lightning and drizzling rain at intervals.
28th	Fresh breezes, S. W. during the day, ..	Cloudy.
"	Fresh breezes, S. W. during the night, ..	Cloudy.
29th	Light breezes, the Westward during the day, ...	Fine.
"	Light breezes variable, S. W. to W. during the night,....	With passing clouds and lightning.

From the Bombay Times of 9th November.

THE MADRAS HURRICANE.—We gave in our last numerous extracts from the Madras papers of the 25th, in reference to the hurricane which occurred on the preceding day. On examining the meteorological records of the Observatory, we find that the first manifestation of this atmospheric disturbance prevailing in our neighbourhood—for here, unless in the heavy swell which extended to the harbour, we had no actual symptoms of storm till the evening of the 30th—became apparent on the 25th; we had then some lightning in the evening, with a rather troubled sky towards the eastern horizon, and the barometer fell about .030. This state of depression continued till the 29th, long before the thunder-storm and rain of the 31st, of which scarcely any prognostication was given, when the mercury had rallied to its usual level. The following note gives the means, the maxima and minima, and the range of a large standard barometer by Newman; the observations are corrected for temperature to 32 deg. F., and for capillary attraction:—

October	24th	25th	26th	27th	28th	29th
Mean of 24 hours' observation, ..	29.720	.699	643	.626	.665	.732
Maxima, ...	29.810	.788	.712	.675	.722	.791
Minima, ...	29.664	.620	.659	.573	.609	.691
Range during 24 hours, ...	146	188	053	102	113	100

From this it will be seen that the day of greatest mean, as well as of greatest minimum, depression, was the 27th;* the day of least range, when the ordinary bi-diurnal fluctuations of the barometer were most affected was the 26th, when the range was about half what it ought to have been, the interval betwixt the maximum and minimum being only .053. The Madras papers give the barometric readings uncorrected, and do not note the temperature so as to enable us to apply the correction, whereby we should have been enabled to give an exact comparison of the fall of the instruments here when the influence of the storm reached us, but nothing more, as compared with that of the Madras barometers where it was raging round. It must be kept in mind that at 10, or rather at 9-45 A. M., the barometer is at its maximum, and at 4 P. M. it is at its minimum elevation, and that in the finest weather the range betwixt these two hours amounts to about .150. On the 24th ult. it stood at Madras, at the first named of these hours, at 29.873; and at the second, at 29.7054: so that the total depression amounted to 1626, or to about one-hundredth of an inch over the average. The mean of 700 hourly observations during the month of September gives .094, as the average range at Bombay betwixt the hours of 10 A. M. and 4 P. M.; the depression at the former of these corrected, as formerly stated, 29.676, that, at the latter, being 29.582. If these circumstances be overlooked, the barometer will appear to be on the rise or fall just as it happens to be examined,, not more than five hours before or after 10 A. M. or P. M., the hours of maximum elevation. Were vessels, when in port, any where in the neighbourhood of a meteorological observatory, to have their barometers and sympiesometers corrected and rated by some recognized standard, it would greatly enhance their value as monitors of approaching storms, and enable meteorologists to avail themselves of the logs and records kept at sea, to an extent which at present it were vain to attempt.

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[*] It will be noted also that this 26th and 27th was the day on which the *Lucy Wright's* storm was nearest to Bombay.—H. P.

The indications of scarcely any two barometers exactly agree; and betwixt the tropics, where the total range scarcely exceeds three-tenths of an inch, the most delicate movements of the mercury must be watched. In marine barometers, besides, the correction for the rise of the quicksilver in the cistern can very rarely be made with any approach to accuracy, and scarcely ever, in any two instruments, however similar, precisely corresponds. It depends upon the relation of the diameter of the tube to that of the cistern, the latter varying not only in different instruments, but in different portions of the same: this invariably makes the observed depression less than what it ought to be. It is still worse with the sympiesometer, whose indications of pressure are so complicated by high temperatures, that unless to those long familiarized with it, it is of little value between the tropics. These imperfections would in a great measure be remedied, were the observer in possession of a schedule of corrections which he could at any time apply. These considerations, if considered of value, might be tested here by the Indian Navy; and we have no doubt would be productive of important results. The instruments, indeed supplied by the Company, especially the thermometers, are often of such indifferent quality, that unless rated or corrected, they are comparatively of little use. Instead of lumbering about amongst arsenal and naval stores, they ought to be placed where they could be taken care of and kept in order; where their excellencies could be pointed out, and their imperfections remedied. It would appear incredible were it stated, that the efficiency of a very able and experienced engineer corps is in many cases neutralized by the wretched economy that refuses to supply instruments fitted for service! Yet we have been told of an extensive district under the supervision of a very able officer, where levelling and general surveying is constantly required, where there is not a level or theodolite fit for the common purposes of road-making; and where, in consequence, the services of highly-gifted and well-paid officers are impeded or thrown away for a consideration, which would not amount to a single week of the pay and allowances!

The Madras gale was encountered by the *Seaforth* Ceylon steamer off Cochin, at 10 P. M., on the 25th; it dismasted the *Lucy Wright*, near Mangalore, on the 26th;* the *Futtay Salam*, from Calcutta, was overtaken and nearly swamped by it, close to the Laccadive Islands;

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* In the following extract it is said on the 27th.

the *Cleopatra* steamer encountered it on her way to Aden, and the *Semiramis* had a midshipman washed overboard when on her voyage from the Persian Gulf. We should feel greatly indebted to any officer whose vessel had been exposed to it, if he would favour us with an extract from his log, as to the time when, the place where, and circumstances under which the gale, or its symptoms, were experience by him.

The Ship LUCY WRIGHT.

Letters have been received from Captain Pollock of the *Lucy Wright*, bound from Liverpool to this port, announcing that his ship, was totally dismasted on the 27th ultimo, in a hurricane in lat. 13° 2′ N. and 71° 39′ E.

The *Lucy Wright* was off Rutnagherry on the 4th instant, and the Captain mentions that her hull has escaped uninjured.

The hurricane appears to have occurred about the same time as that which has done so much damage at Madras, and as it attacked the *Lucy Wright* in the same latitude as Madras, it is not improbable that it was one and the same gale.—*Ibid.*

Extract from the Log Book of the ship HIGGINSON, *nautical time from a Newspaper.*

28th October.—Barometer fell at 6 A. M. from 29.40 to 28.50. Lat. 18° N. Long. 70° 20′ E. "Very heavy gale from West to South with thunder, lightning and much rain, all sails furled, and ship hove to, continued so for six hours, when it began to abate."

Abridged Log of the ship FUTTAY SALAAM, *from Mauritius to Bombay. Forwarded by* G. BUIST, ESQ. *H. C. Astronomer at Bombay, reduced to civil time.*

24th October.—Noon to midnight light breezes W. S. W. to W. N. W. and fine.

25th October.—From noon winds W. N. W. to N. W. and fine, three and four knot breeze, noon Lat. 7° 55′ N. Long. Chron. 68° 14′ E. P. M. moderate, 4 to 7 knot breeze, W. N. W. to N. W., increasing at midnight and "a chopping sea getting up," steering to the N. by E. throughout.

26th October.—Midnight to noon 6 to 7 knot breeze, with heavy N. W. swell, "ship plunging much at times." Noon Lat. acct. 10° 16′ N. Long. 68° 54′ E. 8 M increasing fresh gales W. by N. At midnight S. W. going from 4 to 6 knots to the N. by E. At midnight a gale at S. W. making all snug, vessel making much water.

27th October.—The gale increasing to a hurricane at S. S. W at 4 A. M. when hove to. At 9 A. M. wind marked southerly. At 6 A. M. "blowing complete hurricane, ship perfectly unmanageable, lashed the helm a lee. Tarpaulins in the main and mizen rigging to keep the ship to." Noon gale increasing with a very high sea, vessel straining much. Lat. by acct. 11° 55′ N. Long. 69° 09′ E. The ship lying to, wind marked S. E. blowing a furious hurricane with a tremendous high sea. At midnight gale, but more moderate.

28th October.—A. M. moderating, but still dirty with violent squalls and heavy rain. Daylight, (6 A. M.) moderating fast, at which time "bore up N. West to clear the Byramgore Shoal." At noon Lat. acct. 13° 31′ N. Long. acct. 68° 09′ E. After which fine weather.

The logs end here somewhat abruptly; that is to say, they are not copied up to one having an observation for Lat. and Chron. which is always desirable, for by working the log both backwards and forwards the vessel's true place is better ascertained, and much light is thrown on the action of the currents generated by the storm.

From the Bombay Times.

We subjoin a very interesting notice from Dr. MALCOLMSON of the effects of the Madras hurricane of the 24th of October, for such we have no doubt that it was, off the Arabian coast, where it appears to have reached on the 30th:—

To the Editor of the Bombay Times.

SIR,—In your paper of the 30th ultimo, you requested communications in reference to the late Madras Hurricane, which appears to have swept over a large space, and to have been very destructive in its progress.

Since the publication of Colonel Reid's work on the Law of Storms, the subject has attracted, much attention both in a philosophical, maritime, and practical point of view. Agreeing with the Colonel, that much good would result from the rotatory motion of Gales being understood and acted on by commanders of vessels, when caught in tempests, with this object in view, every authenticated fact that bears on the subject should be carefully collected for future deductions. On this account, I send you a few particulars of the gale or hurricane the ship *Seaton* experienced on her passage from Aden towards Bombay, in which she was dismasted, narrowly escaped foundering, and regained the port with great difficulty under jury masts, leaky, and her hull so much injured, that she has been condemned by survey.

After leaving Aden, the *Seaton* had moderate breezes from the Northward, with clear weather; for two or three days before the gale was felt, they had a very uneasy, broken and turbulent head sea, with light northerly winds, which enabled them to carry royals and main sky sail.

On Sunday the 30th of Oct. P. M., the breeze gradually increased so much, as to require the smaller sails to be stowed, top sails double reefed, main sail and jib also stowed, wind N. and by West. The atmosphere, at this time, had a streaky, hazy, troubled appearance. Barometer falling. When the vessel first felt the head sea, the Barometer indicated atmospheric derangement, but not to such an extent as to induce any apprehension of an approaching gale.

The Barometer being a tried one, led to the belief that rough weather was to be expected, and preparations were accordingly made to meet it. On Monday the 31st, being then in Lat. 14° N., Long. 61° E., whilst in the act of taking in all sail, and having succeeded in getting the top-sails and foresail clued up, and foretop sail partly stowed, the hurricane burst in all its fury. In an instant every stitch of canvas was blown from the yards; even the mainsail, though well secured, was blown from the gaskets, went to pieces, and was entirely lost; as likewise every other sail that was stowed. At 9 A. M. the main top-gallant-mast went by the cap; at 11, the quarter boat was blown away, with one of the iron davits; at 12, the hurricane still increasing and blowing in furious gusts, the ship was thrown nearly on her beam ends. Ballast shifted, water washing up to the lower deck beams, the sea at this time running high and making a complete breach over her,—and from the shifting of her ballast and quantity of water in her hold, she appeared to be bodily settling down. Barometer still falling, and the danger imminent; the main mast was cut away, after which she righted a little, and rose lighter to the sea, but still with a heavy list to starboard. From the great straining of the ship, the water continued pouring in through every seam. At 2 P. M. the foretopmast was carried away a foot above the cap. At 3, the foremast went, four feet above deck, carrying every thing with it; part of the wreck falling across the long boat and pinnace, stove both at nearly the same time. The mizen-topmast gaff, and spanker boom fell on deck, leaving nothing standing above board but the mizenmast. From the exhausted state of the crew, the heavy rolling of the vessel, and the sea continually breaking over her, it was found impossible to clear away the wreck, which, also striking under the counter and different parts of the vessel, threatened serious consequences. Sunday 1st November at day-light, the wind lulled a little. At 8 A. M. the hurricane recommenced with redoubled fury. The wind which before was N. and by W. suddenly shifted to the E. S. E. and settled at E. N. E. Sea breaking over her fore and aft, making a clear sweep of the deck. It is a matter of surprize and congratulation, that none of the men were washed from the pumps, which were kept incessantly going during the intervals of the sea; the spray was flying so furiously and thick, that the forecastle could not be distinguished, and every part of the body that was exposed, smarted from its effects.

On Sunday night the 30th, the Barometer fell to 29.7. During the height of the gale its lowest range was 27.6. The 1st Nov. it rose to 28°: it began to rise four hours before the gale moderated. 2nd, moderate breezes, sea going down, all hands engaged in clearing away the wreck, and getting up some spars as jury masts. Got her before the wind and bore away for Aden, where she arrived on the 15th in a very shattered state, crew exhausted from having been constantly at the pumps.

It is worthy of remark, that during the hurricane, for such it was, the wind which was N. N. W. at its commencement, veered to the Westward, backed round to the E. S. E. and E. N. E. This agrees perfectly with Reid's now generally admitted theory, of the circular and progressive motion of storms. It was fortunate that the *Seaton* was on the proper tack when the wind changed; had it veered forward instead of aft, before the loss of her masts, it is more than probable she would have gone down by the stern, as many ships are supposed to have done in similar hurricanes.

On Sunday evening, the 30th October, there was neither cloud nor fog-bank in the western horizon, yet the sun went down fiery red and contracted in appearance. His rays instead of glancing obliquely across the waves, seemed to dip and lose themselves almost perpendicularly in the long heavy swell. During the height of the storm the rain fell in torrents, the lightning darted in awful vividness from the intensely dark masses of clouds that pressed down, as it were, on the troubled sea. In the zenith there was visibly an obscure circle of imperfect light of 10 or 12 degrees. When the hurricane took off, the scene to leeward was awfully grand,—thick masses of the darkest purple-coloured clouds were rolling over each other in inconceivable confusion, tinged and lighted up in different places by intensely vivid lightning. The hoarse roar of the retiring storm, mingled with the hollow growl of continued thunder, as they slowly retreated with the gale, left an impression on the mind not easily to be forgotten; the respiration of every person on board was affected: this is to be accounted for by the electric state of the atmosphere with which all hurricanes seem to be intimately connected, if not entirely excited and influenced thereby. The lowest range of the Barometer was 27.6. At Bangalore, in which appears to have been the same gale, it fell to 27.4;* but as the *Seaton* seems to have been in the centre of the hurricane, or nearly so, it is very probable that it fell quite as low as 27.4, or even lower. It is a matter of regret, that the state of the Thermometer was not noted. The hurricane will likely be found to have crossed the Persian Gulf, in about the latitude and longitude of Bahrin.

I subjoin an Extract from the Log of the Barque *Chieftain*, which vessel you will observe was not far from the *Seaton* on the 31st.

29th October.—Lat. 7° 52′ N. Long 55° 54′ E. Light airs, cloudy weather, sea calm.

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* This is without correction for the altitude of the station.

30th October.—Lat. 8° 26′ N. Long. 56° 46′ E. Wind N. E. and by E. Light breeze, cloudy.

31st October.—Lat. 9° 40′ N. Long 57° 6′ E. Wind N. N. W. and N. W. and by W. Light breeze, cloudy.

1st November.—Lat. 11° 12′ N. Long. 57° 15′ Wind N. by N. ½ N. to N W. by W. ½ W. Moderate breeze, cloudy.

2d Nov.—Lat. 13° 5′ N. Long 57° 15′ E. Moderate breeze, cloudy, heavy head-swell, ship plunging deeply; ship's head N. and by W.; took in the small sails. Breeze moderate, cloudy, dark gloomy appearance, with vivid lightning; latter part squally with heavy rain. P. M. wind W. by N. veered round to W. S. W. and S. W. By this it is evident, the *Chieftain* met the sea occasioned by the same tempest.

The accounts received up till this date, from different parts of the Arabian coast, convey intelligence of a great number of vessels having been lost in the same hurricane. These have been large buggalows, principally belonging to subjects of the Imaum of Muscat, conveying dates, &c from the Persian Gulf to Aden and different parts of the Red Sea. Fifty-one vessels have been lost to the Northward of Cape Issolleta and between it and Ras-el-had, nine to the Southward of Gardafui, ten between Shabal and Aden; making a total of 70 vessels, the crews in most instances saved.

At Aden, the weather from the 29th October till the 8th November was stormy, cloudy, and unsettled; the tides rose higher than I have known them to do for the last four years; winds from E. N. E. to E. S. E. During this time a heavy sea rolled into the Eastern, Molkut and Bundera-mar bays, which made it impossible for any vessel to have ridden at anchor in either place with any degree of safety. Not having had a Barometer, I cannot say how it was affected; but am of opinion, it indicated the neighbourhood of the hurricane.

The Ship *Maria* left Aden for Bombay two days before the *Seaton*, and arrived at Bombay on the 7th November, having been one month on the passage. An extract from her log shewing her Lat., and Long. and weather met with, from the 29th Oct. till 2nd Nov. would be interesting, and assist in tracking the extent of the hurricane.

I am, Sir, yours faithfully,
JOHN P. MALCOLMSOM,
Surgeon, Political Residency.

Aden, 27th December, 1842.

Before entering on the Summary of the grounds upon which I have laid down the tracts assigned for this storm in both the accompanying charts, I give for the Bay of Bengal, where we have many ship's logs to consider, a tabular statement. I have not thought it worth while, for the few data which we unfortunately have for its progress over the peninsula and in the Arabian sea, to add these to the table; of which the object is to present with more clearness the corresponding states of the weather over a large extent of ocean at the same time than can be done by the mere descriptions.

Tabular View of the Winds and Weather for the Madras Storm of 23d October, 1842.

Date.	Names of Place or Ship.	Winds and Weather.	Lat N.	Lon. E.	Bar.	Ther.	Simp.	Remarks.
Noon, 21st Oct. 1842.	Brig Waterloo,....	NNE. to NE.	° ′ 10 16	° ′ 92 23	..	..	..	To Midnight squally and increasing.
	AT MADRAS.	Fine.						
Noon. 22d Oct. 1842.	Brig Waterloo,....	NE. heavy gale, ...	13 27	90 03	..	..	..	The same throughout; Midnight, wind East.
	Lady Feversham,..	N. and NbW. squally, ...	12 15½	86 5	..	..	..	Increasing to Midnight.
	Ann Metcalfe, ...	Moderate, Noon increasing to Midnight from North, ...	..	..	Midt. 29.20	75	..	Sea from the North, small rain and thick weather.
	London,..	To Midnight fresh NE. squalls.	..	..	29.75	..	..	Ship standing to the ESE. or towards the Storm.
	Sarah,....	1 P. M. breeze from NE. freshening to Midnight, ...	14 52	83 24	..	..	..	
	Stalkart,..	NbE. P. M. NE. increasing and variable	12 10	80 33	..	..	..	High sea from the NE.
	AT MADRAS.	Fine.						
	Favorite, ...	NbE. to Midnight and squally, dark threatening weather, ..	12 12	81 40	..	..	..	

Date.	Names of Place or Ship.	Winds and Weather.	Lat. N.	Lon. E.	Barometer.	Ther.	Simp.	Remarks.
			° ′	° ′				
Noon, 23rd Oct. 1842.	Brig Waterloo, ...	Fine P.M. West South, ...	14 45	88 55	..	..	..	By Noon all sail set.
	Lady Feversham, ...	South, furious Hurricane from Midnight to 6 A. M. Noon moderate ESE.	12 04	..	29.70 to 20 40	..	..	At 1½ A.M. dismasted.
	Ann Metcalfe, ...	4 A.M. gale and Hurricane from the Northward, Noon lulled, P.M. South, Hurricane, ...	12 0	85. 30	8 A.M. 28.70 Noon 28 50 8 P.M. 28 80 Midr. 29.10			
	London, ...	Noon strong gale, NNE. and heavy gusts, P.M. NE. 4 P.M. ENE.....	12 56	83. 55	6 A.M 29.60 Noon 29.70 4 P.M. 29.70			
	Sarah,....	NE. to NNE. P M. Noon hove to, increasing gale, 6 P. M. NE.	14 07	84. 24	29.73	..	..	Bar. 1 P.M., 29.70; at 2, 29.65; at 3, 29.62; at 4, 29.58; at 6, 29.60.
	Favorite, ...	NNE. to NEbN. at Noon strong gale; P.M. NbE. hove to, ...	11 49	83. 35	..	..	..	At 10-15 on her beam ends, wind veered between Noon and Midnight to NE. but time not marked.
	Stalkart, ...	A. M. Hard gales NNE. increasing 10 P. M. Hurricane NNW.	11 33	80. 58	.	..	..	
	MADRAS and Roads, ...	Strong breeze from North, increasing to Midnight.	..	..	.	..	..	Heavy swell from NE.

Date.	Names of Place and Ship.	Winds and Weather.	Lat. N.	Lon. E.	Barometer.	Ther.	Simp.	Remarks.
			° ′	° ′				
24th Oct. 1842.	Brig Waterloo, ...	Fine, ...	14 44	86 38	..	..		
	Lady Feversham, ...	Moderate with squalls, ...	13 16	86 15	..	..		
	Ann Metcalfe, ...	Decreasing from Midnight. Noon moderate, ...	12 6	84 30	4 A.M. 29.20 8 — 29.50	..		
	London, ...	Veering to SE., moderating at Noon, P. M ESE. ...	12 34	83 44	29.70 29.50	81		
	Sarah,....	Veering; NEbE. to EbS. At Noon strong gales, P.M. SSE.	13 34	83 53	4 A.M. 29.63 8 — 29.73			
	Favorite, ...	Daylight SE. Noon moderating, P.M. SEbS.	11 53	83 35	..			
	Stalkart, ...	6 A. M. West furious gale, 10 WSW. Noon moderating, P. M. strong gales South. Midnight fine, ...	11 38	81 31	..			
	MADRAS, ...	At Night smart squalls. 8 A. M. NNW. gale thick and heavy. Noon Wind N. to NbE. 2 P. M. NNE. and NNE. to ENE.; at 6.7. EbS. and ESE.; at 8. SE. 10 clearing up, ...	..	..	8 A.M. 10 —— Noon 29.78 2 P.M. 29.72 9 —— 29.84			
	Ships putting to Sea from Madras Roads, ...	....	..	..	..	..	..	Mostly slipped at 9 to noon and stood out East; 3, stood to the SE.

Note.—The object of this Table being to trace the track of the storm I have not given here (for they offer little or no data for that purpose) the ships which slipped between 8 A. M. and Noon from Madras Roads, which being all in the Northern half of the storm, had all the wind veering gradually from North or NbW. in the Roads to SE. in the offing, and none of them being far enough to the South to meet with the centre. The wrecked ships were partly I think drifted on shore for want of canvas, and partly by the *storm wave* or storm current, to which I shall refer in the remarks at the conclusion.

Date.	Names of Place or Ship.	Winds and Weather.	Lat. N	Lon. E.	Barometer.	Simp.	Therm.	Remarks.
24th Oct. 1842.	Lady Clifford off Nagore to Sadras, ...	Gale from the Westward and WSW.	° ′ Noon 11 9 Midt. 12 20	° ′ 80 10 80 55	Noon 30.60	..	..	Bar. from 29.90 to 30 00: at Noon 29.70; at 5 P. M. and 29.90 at Midnight. Probably too high.
	Pondicherry, ...	10 A. M. NW. to WNW. squalls, 4 P. M. violent Hurricane, 5 P. M. NW. to WNW. and calm when renewed from SW. to South, at 9 P. M. SE.	11 59	..	..	.	..	Bar. rose on the morning of the 24th.
	Porto Novo, ...	Fresh gales NW. 6 P. M. shifted to SW. at Midnight South.	11 31					

Summary.

It is evident enough, that this storm was one coming in upon the Coromandel coast from the Eastward and it will be observed by our charts, that we have secured, through Captain Biden's zealous assistance, a chain of vessels, (which almost appear as if *stationed* there) from the Andamans to Madras; every one of which experienced the commencement of the storm before it terminated with the vessel to the Eastward of her; and every one of which had the winds and shifts of wind exactly as they *should* have them upon the supposition of a great whirlwind, rotating from left to right, or by S. E., N. W.* and moving at the same time forward, *and these winds, and shifts of wind, and successive storms can be explained by no other theory!* If the Law of Storms for the Northern hemisphere was yet to be demonstrated, it could scarcely be so more completely than it has here been: I begin of course with the vessel farthest to the Eastward.

This is the *Waterloo,* which on the 20th October at noon was passing the Southern extremity of the Andamans with fine weather, and from thence steering to the N. W., with fresh N. N. E. breezes. On the 22nd October, we find her at noon in lat. 13° 27′ N. and long. 90° 03′ E, being then three degrees to the Westward of the Andamans, and ten degrees to the East of Madras, with heavy gales from the N. E. which had increased from the midnight preceding; and by midnight of 22nd to 23rd, when she had made about a degree to the Northward and Westward; and when the storm, if it then existed as a circular one, had also travelled to the Westward: the wind was at Eastward moderating. We have no Barometer marked, but this change is that which a rotatory storm would give, and which a mere monsoon gale would scarcely do. I take it therefore, that at noon on the 22nd, the centre of this storm was about 120 miles to the S. E. of the *Waterloo's* position. I have carried the line marking the track from the direction of the Andamans, and if we take the increasing breeze of the 21st to have been part of the storm, the centre will for that day fall to the Eastward of these Islands; but we have too little authority I think, to assign it any place for the 21st.

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* This is Professor Dove's description of the rotation, and as it is better than ours I use it here, and shall use it in future.

On the 23rd, the *Waterloo* had fine weather, having stood to the N. W., and the wind at noon South and S. Easterly, being altogether out of the reach of the storm; another proof also, that her gale of the preceding day was part of a rotatory, and not a monsoon gale.

The *Lady Feversham,* which is the next ship to the *Waterloo,* was at midnight on the 22d-23rd about 220 miles to the S. W. by W. of her, and about on the latitude of the track of the storm; she had the wind increasing so rapidly from the North and N. by W. from noon to that time, that at 11 P. M. 22nd, it was blowing a gale, and at 1-30 A. M. of 23rd, a complete hurricane, so that she was just enveloped in the hurricane when it had entirely left the *Waterloo.* At 1-45 A. M. of the 23rd she was dismasted, and at 2-45, the calm centre reached her. At 3-30, the hurricane is stated to be with her at its greatest force; her Barometer being at 28.30, from which time it moderated, till at noon it is called a strong wind at E. S. E.

The *Ann Metcalfe* is the next vessel, and with her it is not called a hurricane till 8 A. M., or about 8 hours later than with the *Lady Feversham:* and with the *Metcalfe* the calm took place at noon, giving thus pretty nearly the centre for noon that day, which also agrees with the log of the *London,* which had "a strong gale" at N. N. E. at this time, and generally with those of the *Favorite, Sarah,* and *Stalkart.*

These data are all good for the centre of the storm for the 23rd in about lat. 12° N. long. 85° 30′ E. which is also given (evidently in such weather an estimated one) as the position of the *Ann Metcalfe* at noon.

There are, in adopting it as the centre, two slight discrepancies to be noticed; the first, that though it is only 45 miles to the Westward of the *Feversham's* position, that vessel at noon had the weather moderating fast, and wind from E. S. E.; the second, that the direction of the wind with the *Favorite* (N. N. E.) if her position is right, would place the centre further to the Southward, and the last, that though almost fine with the *Feversham,* it was beginning to be felt as a gale by the *Sarah,* which was at 145 miles of distance from this centre.

We cannot, however, take upon ourselves to alter the estimate of a vessel's position, though the storm wave and storm currents must have carried some of the vessels much beyond or within their estimated drifts. It is probable, that as the *Feversham* had no observation, she may have been in error.* The whole difference which these considerations make is not much, but I note them to shew that nothing is overlooked. Are they to be accounted for by the theory that the progressive motion of a rotatory storm, particularly when as in this case it is a rapidly moving one (12 or 13 miles an hour) tends to generate the rotatory motion farther before it? We know so little of how they act, that this supposition is at least worth mentioning. Most accounts of storms seem to agree in this, that the force of storms and the rise of the Barometer are greater and more rapid than their increase or its fall. I have marked on the chart, the spot where the *Washington* foundered on the 25th. As she had the hurricane from the Eastward, she was to the Northward of its track, and must have drifted up after it was over with the S. Easterly winds, which we see the *Lady Feversham* had, and which indeed seem usually to follow the N. E. quadrants of the storms, and sometimes their S. E. quadrants also. The ship seen by the *Washington* was probably the *Lady Feversham,* which had only a foremast left standing, though this last vessel's log does not mention any other vessel in sight; but when all hands are busy rigging jury masts and pumping, the look out is rarely attended to. The *Washington* in her sinking state, was no doubt most anxiously looking for ships.

We have now to consider the probable place of the centre at Noon on the 24th, which day it will be recollected is that of the storm's reaching Madras and Pondicherry. At Madras the veering of the wind N. N. E. by N. E. and East to S. E., with fine weather, shews clearly enough, that the centre passed to the South of that place, while the veering of the wind at Pondicherry from N. W. by the West to S. W., shews also, that it passed close to the Northward of that settlement; the short calm interval noted in the reports being the time of the passage of the centre. This is stated to have been at 20 minutes past 5.†

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* See concluding remarks.

† The lowest depression of the Barometer at Madras is stated to have been at 4 P. M. 29.704; it seems to have been 4.15, P. M. before the wind was at East, but as I have already explained before, the direction of the wind varies much on approaching the land.

Now from Noon 23rd to half-past 5 of the 24th is 29½ hours, and the distance between the place of the centre on the 23rd and Pondicherry is 385 miles, which divided by 29½, gives about 12.4 miles per hour. In the 5½ hours from Noon, the centre would at this rate have made 68.2 miles, which gives the distance of the centre, bearing about West from Pondicherry at Noon on the 24th or in lat. 12° 2′ N. long. 81° E.

We have now to trace the storm inland, and for this purpose our materials are the letters and reports from Ryacottah, Bangalore, Bellary, Salem, Madura, Paumban, &c., and from Cochin and Tellichery, on the Western coast. For these we are indebted to Capt. Campbell, of the Revenue Survey; to Capt. Newbold, Assistant Commissioner of Kurnool, whose able remarks I have placed in the Summary; to Mr. Crozier, Sub-collector of Madura; Mr. Bruin, Magistrate of Mangalore, and Mr. Bourgoin, Governor of Mahé, and my readers will now please to refer to Chart. II. Ryacottah is in Lat. 12° 31½′ N. Long. 78° 5′ E., and its bearing and distance from our centre of the 24th is about W. b. N. 184 miles, and we find that by 4 P. M. of the 24th it was blowing strong at North. By 9, it was blowing in doors and windows, so that we may take it fairly to have begun as a gale at North at 6 P. M. on the 24th; and as by 3½ A. M. on the 25th, the wind was at East with the Barometer at 29.636, its lowest depression, we may assume that the centre was now on or near the meridian of this place, at say 60 or 80 miles distance; for we see by Capt. Newbold's letter, that it was felt severely at Salem from the N. E. (time not mentioned,) which shews that its centre, taking it to be then a circular storm,* was yet to the South of that station, and that it was *not* felt at Madura, 104 miles South of Salem, or 154 of Ryacottah. In estimating the position of it, we may take this spot to be also at the same distance from our centre of the 24th (already laid down) as Ryacottah itself, or 184 miles, or about in the latitude of Porto Novo; so that we have the storm travelling from Noon 24th to 3½ A. M. on the 25th, or in 15½ hours, 184 miles, or 11.9 per hour, our former rates being 12.4 miles per hour, a less retardative rate than we have hitherto found in former storms.

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* Salem is about 50 miles S by E. of Ryacottah.

Taking this rate, we may carry it farther on from 3½ A. M. to Noon of the 25th May, which will give us, taking it to have passed on a nearly W. S. W. course, but curving as it passed Pondicherry, so as to form an arc, 8½ hours at 11.9 per hour, or about 100 miles beyond the meridian of Ryacottah, if it still moved at the same rate, though of this we are not certain. This calculation would place the centre at Noon 25th in lat. about 10° 30′ long. 77° 00′ E. or about the head of the Paulgatcherry Pass on its South side, as supposed by Captain Newbold in the extract which follows in the next page.

We next find that according to the extract from the Bombay paper, the *Seaforth*, Ceylon steamer, encountered the storm at 10 P. M. on the 25th off Cochin. I have only this brief notice of this vessel's log, and thus we cannot say if she encountered its Northern or Southern half, or its centre; but as the track of the storm certainly trends to the N. Westward in the Arabian sea, as we shall see by the subsequent logs of the *Lucy Wright*, *Futtay Salam*, &c. we may say that it was in all probability the centre or the Southern half of the vortex, which the *Seaforth* met with. If we take her to have been 60 miles from the coast, which in the dangerous month of October is not an excessive offing, this would give, from our centre before mentioned a distance of 110 miles in 10 hours, or 11 miles an hour, or nearly its former rate. It must be recollected, that if the *Seaforth might* have been much closer in shore, the storm also *might* have been much retarded by the steep escarpments of the pass; and all we wish to shew is, that there is connection enough between its rates of travelling, and the times at which it was felt in various places, to enable us to pronounce, on fair and reasonable, if not on positive grounds, that it was *the same* storm throughout.

Before tracking it farther at sea, I shall give here Capt. Newbold's highly interesting views as to the passage of the storm over the peninsula.

"From the physical configuration of the country to the North, West, and South of Madras, it strikes me that any aerial current coming from the Eastward, would be directed from its progress in a direct Westerly direction by the high line of the Eastern Ghauts, and turned in a South-Westerly direction by the break of Salem, whence sweeping across the plains of Coimbatore at the Southern base of the *Koonda* and *Nilgherry* escarpments, it would be concentrated on that singular gap in the Western Ghauts—the Paulghautcherry pass, whence it would make its escape Westerly to the Indian Ocean in the direct latitude of the Laccadives. I enclose you a small map, of which I beg your acceptance, on which I have marked by arrows, the probable direction of the Madras storm,* which if it be the identical one that visited the Laccadives, must have pursued this course, and have been felt at Arcot, Vellore, Salem, Darapooram, Coimbatore, Paulghautcherry and Paniani, on the Western coast, the appropriate situation of which I have marked in ink on the map. It will be also seen, that currents of air, blowing Easterly across the peninsula about the latitude of Madura, and winds blowing Westerly about the latitude of Cochin or Alleppie, must be diverted Southerly by the Western Ghaut ridge to Cape Comorin, a circumstance which may account for the gusts experienced off this Cape during *both* monsoons. Winds blowing from the W. in the latitude of Paniani and N. of it, Calicut, Tellicherry, and Cannanore perhaps, would be deflected by the Ghaut barrier Southerly, in the direction of the arrows on the map marked B. to the great gap of Paulghautcherry, and thence rush through it Easterly on the plains of Coimbatore and Salem.

"The exact points where the winds are thus deflected, their minute variations of current, with their various minor influencing causes, are still matters of interesting research and a meteorological desideratum: but that they are deflected as I have described on the grand scale by the Ghaut lines of elevation which constitute the main features of the physical contour of Southern India, there can be little doubt. It is a well known fact, that where these ridges attain a certain height, neither the North-East nor South-West Monsoons usually ascend above them. I was crossing the Eastern Ghauts at the time of the storm at Madras a little S. of the latitude of Nellore, and observed an enormous mass of irregular clouds rise from the Eastward, and advance rapidly on the mountain; here the great bulk was arrested, and (collected by electric attraction?) into a long, horizontal, wall-like bank, of solid aspect and of a deep bluish hue, varied at the edges by flocculent curves and zones of sombre grey, which appeared in vivid distinctness, as ever and anon coruscations of lightning shot up and illumined portions of the gloomy mass. In height and contour, they assimilated the mural barrier opposed to them. They remained in this sullen form apparently motionless for a day or two, when they gradually dispersed. There was little wind in the sheltered valley along which I travelled, and that little variable. A few detached higher clouds escaped and passed slowly to the Westward, while portions of the upper edge of the cloudbank would sometimes curl over the top of the ridge, like the falling crest of a wave dispersing in spray, and descend in a transient shower on the Western slopes. An almost similar phenomenon is presented on the table lands on the

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* I have copied in my Chart No. II, as much of the chain of Mountains as relates to our present subject.

West flanks of the Eastern Ghauts on the commencement of the N. E. Monsoon.*

"The almost effectual barrier presented by the Eastern Ghauts to the force of the N. E. monsoon is a proof, that this great aerial current is confined, generally speaking, to the lower strata of the atmosphere. The same may be perhaps said of the Madras storms, which generally travel from the East. Though often *commencing* from the N. and N. W., the current from the East first striking the Ghaut line to the N. of Madras, that city thus receives this deflected Southerly current previous to the arrival directly of the main body from the East. The foregoing remark, of course, you must apply with much modification to the *true whirlwind storm,* which owes its vortical movement to far different causes. The *average* height of the Eastern Ghauts N. of Madras is about 1,500 feet.

"Places situate on the table lands *East* of the *Western* Ghauts experience still less of the S. W. Monsoon (the heavier of the two,) than the tracts sheltered by the Eastern Ghauts from the N. E. Monsoon. This is ascribable to the greater *average height* of the former, (3,000 feet above the sea,) and to their more continuous character as a mountain chain. The almost only exception to this remark arises from a remarkable opening in them; viz. the gap of Paulghautchery, which I have already alluded to as the probable route by which the Madras storm found its way across the peninsula to the Laccadives. It may be as well here to state in corroboration of this supposition, that it is well known (Madras Almanac 1840) that ships navigating the Malabar coast during the *N. E.* Monsoon, commonly experience a stronger gale in the neighbourhood of Paniani than elsewhere; and this break in the Ghauts appears to be the cause of this effect.†

"During the S. W. Monsoon, the Westerly wind, which sweeps through this pass from the beginning of June until about September, is extremely violent at Darapooram and other places to the Eastward in a line with its longitudinal axis, as its influence is felt even farther East than Trichinopoly; but at other places a little N. or S. of the line of the pass, the current is hardly perceived. The pass is from 16 to 20 feet wide, narrower at the E. than at the W. extremity: lofty rocks of the Koondah and Nilgherry chains on its Northern, and the Palghaut groups on its South flank—its surface is pretty level; the slope from the plains of Coimbatore to those on the coast so gradual as to be almost imperceptible; the height of the pass above the sea about the centre (roughly approximated by means of the boiling point of water) is 900 feet.

"I will write to Salem for such information as I can procure."

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* We are forcibly reminded here of the Devil's Table Cloth preceding a S. E. gale in Table Bay.—H. P.

† This is confirmed by Horsburgh, and the experience of all navigators in that sea

The foregoing views it will be seen, by those who have followed the series of these memoirs, are exactly analogous to those advanced in my first memoir, where I have given a chart illustrative of the deflection of the S. W. Monsoon, by the mountains on the coast of Arracan, from Cape Negrais Northwards, by the Cachar and Bootan ranges, till, by those of the Himalaya, the S. W. Monsoon for a part of its duration is converted into a stream of Easterly winds. There can also be little doubt, that as Capt. Newbold remarks, the winds and hurricanes rarely extend to any great perpendicular height, and are thus constantly subjected to all the deflections and interruptions which hill and mountain ranges occasion.

We have now, having I think, shewn satisfactorily that the storm was identically the same with that of Madras (?) to follow it in its course in the Arabian Sea; and our next document is, (not neglecting to note the fall of the Barometer at Bombay, from the 25th to the 29th as we proceed,) the notice of the dismasting of the *Lucy Wright*.

This vessel was on the 27th, when the height of the storm occurred with her, in lat. 13° 2′ N. long. 71° 39′ E. This spot is distant 340 miles from that at which we have placed (by estimation only) the centre of the storm on the 25th at Noon at the head of the Paulghautcherry Pass, and we know that while it was raging at sea with the *Seaforth* ten hours later, it was not felt, though there were clear indications of it, to the experienced native craft and fishermen, and these would doubtless have been much more distinct with the assistance of a Barometer and Sympiesometer, at Tellicherry and Mount Dilly, 100 miles to the North of the *Seaforth's* position. Our reports from Mahé and Karical also confirm this; but again at Mangalore we find on the 25th, strong gusts of wind from the N. W., as if there was then a commencement of a storm hereabouts, the original one having separated into two by the various obstacles it met with. It is, however, just possible, that these N. W. gusts were nothing but parts of the storm pouring over the Western Ghauts. The *Higginson*, 75 miles West of the *Lucy Wright*, had a heavy gale for 6 hours from West to South *on the 28th*, and must have been therefore in the S. E. quadrant of it; the centre being thus to the N. W. of her, and having passed nearest to her, and to the Northward, at 6 A. M. of the 28th, as would appear by the fall of her Barometer. We do not know how the *Lucy Wright* had the wind, so that we must take the *Higginson's* datum as the nearest and most detailed, and *her* account, with what we have already remarked of the limited extent of the storm off Cochin with the *Seaforth,* which excludes the supposition of these storms being the same, may allow us to assume, for we can do no more, that at 6 A. M. on the 28th, the centre of a storm was, say 40 miles or less to the North of her, and that her Easterly and N. Easterly drift with a Westerly and South-Westerly gale brought the wind to South, which it might quickly do when on such a small circle.

We know only of the *Lucy Wright,* that she was dismasted the day preceding, but in what part of the storm, or where she may have drifted to by this time, 6 A. M. 28th, we are quite ignorant. I have therefore not marked any circle for her on the 27th,* and though it is certain that, as we shall presently see there were two storms, we do not know their tracks hereabouts.

But we now find by the *Futtay Salam's* log and track, that she had been running to the N. by E. from about lat. 8° to lat. 12°, and between 68° and 69° E. till midnight of the 26th, when she evidently plunged into the circle of a storm on its S. E. quadrant, as she had then a gale from S. W. which increased to a hurricane from S. S. W., South, and S. East, moderating again a little by midnight of the 27th-28th; so that she may be taken, from midnight of the 26th to midnight of the 27th, or for 24 hours, to have been drifting, and pretty close to the centre, across the S. E. quadrant of a storm, of which the centre was of course brought successively to the N. W., West, and S. W. of her, as it progressed and the vessel drifted.

Now if we consider this with the chart and log before us, we may fairly allow, that at Noon of the 27th, the centre of the *Futtay Salam's* hurricane bore from her about West, 30 or 40 miles, or was in lat. 12° 00′ N. lon. 68° 20′ or 30° E., and I have from that point struck a circle to shew it. This circle will also shew, *that this storm and the*

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* There is a considerable degree of uncertainty about all newspaper extracts relating to storms, on account of the errors with which, even in the best printed ones, these accounts always abound. Mr. Redfield I think alludes to the same circumstance, as much diminishing the value of newspaper notices.

Higginson's could not have been the same, for the *Higginson* being bound *to* Bombay, must have been on the 27th, (unless she lost ground between that and the 28th,) somewhere to the Eastward of her position on the 28th, which would place her on, or not far from the meridian of the *Futtay Salam's* storm, where she would first have had the wind from N. E. East or S. E., being in its Northern half; whereas she had it "from West to South," or was in its *S. Eastern* quadrant like the *Futtay Salam* on the 26th; and if on the 27th at Noon, the *Futtay Salam's* hurricane be supposed to reach to the *Lucy Wright's* position, and have been there violent enough to dismast her, (at a distance of 180 miles from its centre,) which is very improbable, this would *a fortiori* have given the *Higginson* an Easterly or E. S. Easterly hurricane *on the 27th;* when it is apparent that she had fine weather; for it was evidently not then even threatening enough to be mentioned in her log. She was, as I before said, bound *to* Bombay, and must therefore have been coming from some point between S. and N. W., and this would always have given her bad weather from some quarter on the 27th, as would also any track we can suppose for the storm. Hence it is clear, that the *Futtay Salam's* hurricane and the *Higginson's* storms could not be the same; as the *Lucy Wright's* and *Higginson's* might have been so, the one being dismasted on the 27th, and the other meeting a storm as she came from the Eastward on the 28th. *In the absence of further information then,* I suppose that there were here, as we have found before where the track of a storm crosses, or makes a considerable angle with the prevailing Monsoon, *two* storms.* Of these I take the *Lucy Wright's* and *Higginson's* to have been the smaller one, and the *Futtay Salam's* and *Seaton's,* which we must now consider, to have been the greater and more direct one.

The *Seaton's* storm it is clear from the shift of wind was a severe hurricane travelling from the E. by S. or E. E. S. to the W. N. Westward. I have marked the Lat. and Long. at which it first struck her, and that to which she might have drifted between, say 6 A. M. on the 31st and 6 A. M. on the 1st with a N. N. Westerly gale, drifting before it at the rate of 3½ miles per hour, the least which we can allow for a disabled ship. This brings her to lat. 12° 36′, long. 60° 38′ E. as the spot where the centre passed her.

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* The probability of two storms is much increased, as far at least as mere dynamical forces and interruptions go, by considering how many currents our storm must have created in its passage over the Ghauts, and the interval of threatening weather only along the coast under the line of the Ghauts.

We have from this point then, which is tolerably well ascertained, and which the storm reached at 8 A. M. on the 1st November, the following data in time and distance.

	Distance. miles.	*Time.* days.	 hours.
To the centre of the *Futtay Salam's* hurricane, Noon 27th October, ...	480	4	18 or 114 h. or 4.2 per h.
To the centre of the 25th at Noon, near the Palghautcherry Pass, ...	990	6	18 or 162 h. or 6.1 per h.
To the centre of the 24th to the Eastward of Madras.	1230	7	18 or 186 h. or 6.6 per h.

The mean of this is 5.6 per hour, or only one-half of what we allowed it to have in crossing the peninsula, and less than half of what we have proved it to have had in the Bay of Bengal; but then we must not forget, first, that it had to force its way over the peninsula, and through 900 miles of distance in the Arabian Sea against the S. W. Monsoon; next that these sort of calculations and allowances always assume some initial force or rate of motion; and lastly, that we know absolutely nothing at all of the *cause* either of the rotatory or progressive forces, or of their opposing resistances and retardation, or if they acquire, or have under any, or what, circumstances, the power of increasing the velocity of either of their motions.

Of all these things, and of much more which will readily occur to men of science, we are profoundly ignorant, and as I have before said, all we can now do is to register accurately, and deduce—when we must deduce—doubtingly.

The log of the *Chieftain* is the only one which now remains for us to remark upon, and it will be evident that she was on the 2nd November just far enough within the verge of the vortex to feel the sea, and have the threatening appearances with the wind veering as it would do on the southern half of a storm, as the vortex passed on ahead, and to the Northward of her. Her position when compared with that of the *Seaton* at 6 A. M. on the 1st, shews that the track of the storm was now tending to the N. W., and we find accordingly by Dr. Malcolmson's account, that it was severely felt on the Arabian Coast, and that there were some indications of a storm at Aden. We cannot, however, upon such vague accounts, pretend to track it any farther. I grieve to add that; to the disgrace of those who may deserve the blame; neither the log of the *Cleopatra* or of the *Semiramis,* both Government steamers, have been obtainable; I have strong suspicions that both ran headlong into the storm circles. Is the Government of Bombay aware that a mistake of this kind might cost it a steamer, or at least half of a lac of rupees of damages?

Conclusion.

I mention with some satisfaction here, not only that this is the first storm which we have tracked in what must soon be the great highway between England and India, the Arabian Sea, but also that we again find confirmed the law which my previous researches have shewn to hold good for the China Sea and Bay of Bengal, *i. e.* that the storms always come from the Eastward, and travel to the Westward, and it is gratifying to have now ascertained this, with some trifling intervals over 60 degrees of longitude, or one-sixth of the circumference of the globe. As public attention is gradually drawn to this important subject, we may hope that, ere long we shall at least be able to trace the storms of this great, and to us most important division of the Ocean, with as much accuracy as those of other parts of the Eastern Seas.

I must not omit also to point out an important practical lesson for the navigator on the Coromandel Coast, which should not be omitted, and it is this. Those who have studied this subject, and are acquainted with the publications of Reid and Redfield relative to the storms of the Western hemisphere, and with my own relative to those of the Eastern hemisphere, are well aware of the abundant evidence which exists (and there is much more yet unpublished,) to prove the existence of "storm waves" and "storm currents."*

To those, however, who are not fully acquainted with the subject, I may say, that the "storm wave" is a mass of water of greater or less diameter according to the storm, raised above the usual level of the ocean by the diminished atmospheric pressure and perhaps other causes, and driven bodily along with the storm or before it, and when it reaches bays or river mouths, or other confined situations, causing by its further rise when contracting, dreadful inundations; but upon open coasts rarely so, or not in so great a degree, as it can there spread out quickly and find its level.* The "storm current" may be briefly described as circular streams on the circumferences of rotatory storms, and of this also we have evidence enough for the mariner at all times to admit, and be on his guard against the *possibility of*, or even the *great probability of*, them.

We have thus in every storm two sets of forces (currents) independent of that of the wind, acting upon a ship; the one carrying her bodily onward on the track of the storm, and the other drifting her round the periphery of that part of the storm circle in which she may be.

Taking, as the simplest case, and one nearly that of Madras Roads, a storm travelling from East to West, and striking upon a Coast running North and South, its centre passing over Pondicherry, we should have then, for all ships in the offing, one current, "the storm wave" carrying them directly on shore, with greater or less velocity, as they were nearer or farther from the centre; and other currents, "the storm currents" varying in their direction according to the situation of each ship in the storm circle, but always agreeing pretty nearly with the direction of the wind.

The current of the storm *wave* then is setting due West, but that of the storm *current* West on the North side of the storm circle, and due *East* at its South side; South at its Western edge, and North at its Eastern side, and so on in all the intermediate directions; and a ship putting to sea from Madras roads in our supposed case, will be carried right towards the shore by the *storm wave*, and to the S. Westward also by the *storm current;* but if putting to sea from

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* The deep sea wave also, (the *flot de fond* of the French writers) no doubt assists the inundation; but as this is not a surface cause, I do not allude to it.

any place to the Southward of Pondicherry, she would be carried one way by the storm wave, and the opposite one, or partly so, say to the S. E., East, or N. E.: by the storm current; so that as to mere Westing, the effect of the one would probably neutralise that of the other. The case of ships on the Northern half of the storm, where both forces are against him, should however be borne seriously in mind by the seaman. It was probably the cause of the indraught which wrecked the ships which were lost in this storm, and of some of the others finding themselves in much shoaler water than from their run, they might reasonably have supposed. Captain Biden's suggestion in the port orders, to keep a due attention to the lead in these cases is then founded not only on merely sound nautical experience, but upon good scientific grounds also. To neglect the lead is a positive act of barratry or folly, for in these storms it is impossible to estimate the true distance from the coast by any other means, and the three forces, the "storm wave," "storm current," and the drift occasioned by the wind, would form a complex problem in fine weather. The seaman will not fail to recollect how much influence the storm wave may have upon his position in places where, as in the British Channel,[*] a storm coming from the Westward, brings with it a vast mass of water from a great Ocean like the Atlantic, so that with a Southerly or South-westerly gale, he finds himself set far to the Eastward by some hitherto unknown but fatal current: and I trust that when I say that, if we can obtain documents, we may trace out accurately the laws of these dangerous complications, I shall add another claim to the assistance of every right minded seaman, and of every friend to humanity.

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[*] I allude here, it will be perceived, to the two recent and harrowing catastrophes of the *Reliance* and *Conqueror*. In both these cases the gale being Westerly, the vessels were on the Southern half of the storm circle, and had thus both the storm wave and storm current carrying them far to the Eastward of their reckoning.

Translation of the Naipáliya Devata Kalyána, with Notes. *By* B. H. Hodgson, *Esq. Resident at Kathmandoo.*

1. May the first born, the holy Swayambhu, Amitaruchi, Amágha, Akshobhya, the splendid Vairo Chana, Manibhava, and the supreme spiritual preceptor Vajra Satwa preserve us in all our journeyings and in all our abidings: May Prajna, Vajradhátwi, the all-bountiful Arya Tárà, and the rest be propitious to us. I adore them.

I. Fully to explain the substance of the stanzas comprised in this little manual, would require a comment ten times as large as the text: I must therefore content myself with simply announcing a few of the general principles of Buddhism, which may serve to connect the sense of the stanzas, leaving the exposition and proof of those principles to a future occasion, if not, to more competent ability. Buddhism, as it is to be found not only in the recent writings and present practise, but also in the very ancient Bouddha scriptures of Nipal, recognises a theistic, as well as an atheistic, system of the universe. According to the former, from an eternal, infinite and immaterial Adi Buddha proceeded, divinely and not generatively, five lesser Buddhas, who are considered the immediate sources (Adi Buddha being the ultimate source) of the five elements of matter, and of the five organs and five faculties of sensation. The moulding of these materials into the shape of an actual world is not, however, the business of the five Buddhas, but is devolved by them upon lesser emanations from themselves denominated Bodhisatwas, who are thus the tertiary and active agents of the creation and government of the world, by virtue of powers derived, immediately from the five Buddhas, ultimately from the one supreme Buddha. This system of five Buddhas provides for the origin of the material world, and for that of immaterial existences, a sixth Buddha is declared to have emanated divinely from Adi Buddha, and to this sixth Buddha, (Vajra Satwa by name,) is assigned the immediate originization of mind, and its powers of thought and feeling. The five, as well as the six Buddhas, are constantly invoked collectively under the names of the Pancha and Shata, Buddha and Ratna. All these Buddhas are often styled Ripopadaka, Manasi and Dhyani, titles which would seem necessarily to distinguish them, not only from the mere mortal Buddhas of the Swobhavika sect, but also from *any* generatively produced beings. Nevertheless in the first stanza of this manual (no very good authority) a sakti or spouse is assigned not only to each of the five Buddhas, but also to Adi Buddhà himself: and I suppose therefore that with respect to these Bouddha goddesses of the Aishwarik, as we must adopt the fantastic theory of the Vedantika Brahmanists, and consider them mere nominal deities; until we can assert (as I think we shall soon be able to do) that the theory of Sakties is a modern corruption of Buddhism derived from Brahmanism. I am aware that the Swobhavika Saugatas typify the innate powers of matter by a Goddess, but this is a notion totally different from the assignation of a female medium of activity to creators working declaredly by volitions, or (as the Bouddhas phrase it) by Dhyánas: and such is the statement which I have found in respect to the "Pancha Buddha" of the Aishwarikas in works of higher authority than the Kalyána. But to return to my text, from which I have unwittingly too far deviated; the invocation of the first stanza is first, to the supreme Buddha, next to the six Buddhas, (whose more familiar names will be found below,) then to the Sakti of Adi Buddha, and lastly to the Sakties of each of the six Buddhas. The names of these ladies are as follow: Adi Buddha's Prajna, Vairo Chana's Vajradhatweswari, Akshobhya's Lochana, Ratna Sambhava's Mâmukhi, Amitabha's Pandara, Amogha Siddha's Tárà, Vajra Satwa's Vajrasatwatmika.

2. May the Goddesses Sampatprodâ, Ganapatihridayá, Vajravidrávini, Ushnishă, Parna, Kitivaravadana, Grahamátriká, Kotilákshi, and the Pancharakshá be propitious to us. I adore them.

2. The distinction of Swobhavika and Aishwarika Buddhists has already been alluded to. There is another division into exoteric and esoteric doctrines. The goddesses invoked in this stanza belong to the esoteric system, and to the Swobhavika school: for they are all said to have been produced from Swobhava "each with her own Vija Mantra." It may be proper here to observe that the Swobhavikas do not deny intelligence, but immaterial entity. They insist that those powers which others say were impressed on nature by the God who created nature are proper to matter itself which alone is; and which is eternal, not in its palpable individual forms, but in its impressable elements. They add that nature produces not only man but superior beings, (though none with such a plenitude of power as man is *capable* of attaining,) and amongst these beings are the goddesses invoked in this stanza. The more familiar, and (as it were) *proper* name of Sampatproda is Vasundhara, of Kitivaravadana is Marichi, of Kotilakshi is Pratingira, and the names of the five Rakshas are Pratesara, Máhasahasrapramurdini, Máha Mayari, Maha Setavati and Máha Mantranusarini.

3. May Ratna Garbha, Dípánkara, the Jiña Manikusama, Vipasyi, Sikhi, Viswabhù, Kakutsat, Kanaka Muni, Kasyapa, and Sakya Sinha: may all the past, present and future Buddhas, whose excellence exceeds the bounds of the ten faculties be propitious to us. I adore them.

3. The objects of invocation in this stanza are ten Manushi Buddhas. The seven last are the famous "Sapta Buddha," and I doubt the propriety of associating any other to them. I am told that the Karana Pundarika assigns these 10 Buddhas to the four yugas, giving the three first named to the Satya, an idle story, or at least a legend contradicted by higher authority, such as that of the Sambhu Purana, which makes Vipasyi and Sikhi the Buddhas of the satya yuga.

4. May the first of the Bodhisatwas named Avalokeswara, may Maitreya, Anauta Ganja, Samantbhadra, Kshitijathara, Khagarbha, Sarvadyonevarakhya, Kulisvaradhara, and the great Manja Natha be propitious to us. I adore them.

4. Nine Bodhisatwas are invoked in this stanza, for all of whom the commentator claims a celestial origin and parentage, as follows :—

Aryavalokeswar, ...	Son of Amitabha.
Maitreya, ...	ditto „ Vairo Chana.
Gagan Ganja, ...	ditto „ Akshobhya.
Vajra Pani, ...	ditto „ ditto.
Manja Natha,..	ditto „ ditto.
Samanta Bhadra, ...	ditto „ Vairo Chana.
Kshiti garbha, ...	ditto „ Ratna Sambhava.
Kha Garbha,..	ditto „ Amitabha.
Sarvani Varana Viskambhi, ..	ditto „ Amogha.

In this enumeration the more familiar names of the Bodhisatwas are preferred to those of the text. This commentator was doubtless an Aishwarika Bauddha, and a recent one who, according to the prevalent modern fashion has resolutely assigned a heavenly origin to Bodhisatwas of mortal mould. The first (who is the same with Padma Páni,) fourth and sixth are notoriously celestial sons of the Divine Buddhas to whom they are assigned, but the others, and especially Manjnath, are doubtless of mortal origin, and historical personages.

5. May that light which, a proportion of himself, the supreme Buddha caused to issue from the lotus that sprang from the seed planted in Nagavasa by Vipasyi, and which, (light,) itself one, became five-fold in the five Buddhas for the preservation of mankind, be propitious to us. I adore it.

5. Here the object of invocation is to the Jyoti-rup-adi Buddha of Sambhu Nath mountain, a portion of the supreme Buddha revealed in Nipal in the form of flame. The legend is to be found in the Sambhu Puran, but is too long for insertion here. It is said by the Bouddhas of Nipal, that the ever-during flame still burns in the centre of the hemisphere of Sambhu Chaitya.

6. May that mysterious portion of Prajna, born of the lotus with three leaves in the form of Guhyeswar, made manifest by Manja Deva, void of form, the personification of desire, favourable to many, the giver of boons to her worshippers, praised by Brahma, Vishnu and Siva, revealed on the 9th day of the dark half of Marg in the fathomless waters (of Nagavasa), be propitious to us. I adore *her*. (Qy. *it ?*)

6. The Jal-surupa-Prajna of Nipal is here invoked, a portion of Prajna (the Sakti of Adi Buddha) in the form of water. This legend is a part of the foregoing, and is to be found in the Sambhu Puran. When Manja Nath had let off the waters, Jyoti-rup-Buddha was revealed: Manja resolved to raise a chaitya over the sacred flame, but when he essayed it, water bubbled up so strongly on the spot that he could not lay a single stone: perplexed, he resorted to prayer, when Guhyis-wari or Tal-rup-Prajna revealed herself for a moment; so immediately the water subsided, and Manja completed

the chaitya. I have translated "nairatmya" without form, and "agadhe" in fathomless *water*, in obedience to two comments, and to the opinion of a learned Buddha, to whom the words and meaning of these stanzas are as familiar as household terms.

7. May Ratna Singeswara, who was produced out of the union of a portion of Maitreya and of the light of the jewel of Manichura, who issued in the form of Srivatsa out of the riven rock on mount Manichur; whom the other seven Vitaragas reverence as their chief; and who is the raft by which the ocean of life may be crossed; be propitious to us all. I adore him.

7. In this and the seven following stanzas the eight Vitaragas of Nipal are invoked. Vitaraga is a portion of a Bodhisatwa, revealed under some non-human form.

In stanza 4, we have seen that there are nine famous Bodhisatwas. Of these the first, or Aryavalokeswara, never individuated a portion of himself, nor has he any manifestation but under a human form.

The individuated portions of the remaining Bodhisatwas are styled Vitaragas. Maitrègás is the first, under the name of Manisingeswar, and form of a waving flame called Srivatsa. The forms of the remaining Vitaragas are severally, a lotus, a flag, a kalas, a chowry, a fish, an umbrella, and a conch. Some say that the singa is also a form common to all the Vitaragas, whilst others insist that singa here applied to them means merely sign-symbol. The symbols of the eight Vitaragas are often called collectively the "eight mangalas." Manichura was a Raja of Saketa Nagar or Ayodhya, in the crown of whose head grew an inestimable jewel, which he offered to the gods to avert their wrath in a general calamity. The legends of the Vitaragas are to be found in the Sambhu Puran. They are too long to be inserted here.

8. May that portion of the Bodhisatwa Gaganganja, which at the command of Padmapani assumed the form of a lotus, in order to relieve the cruel Raja Gokarna after he (the Raja) had, in atonement for his sins, become a penitent and worshipper of Padmapani on the banks of the Vachmati, and which, as Gokarneswara Vitaraga, still remains at the confluence of the Vachmati and Amoghvati for the purpose of delivering the ancestors of those who pay their devotions there, be propitious to us all. I adore *it*. (Qy. *him ?*)

8. Invocation to the second Vitaraga under the name of Gokarneswara. Gokarna was a Raja of Pancha Des in the East of Hindoostan, says the comment.

9. May the mighty Vitaraga named Kileswara, who is a portion of Samanta Bhadra, and who took the form of a flag in order to frighten the furious serpent Kulika, when he secured it with the flag-staff on

the mountain of Charugiri for the preservation of mankind, be propitious to us all. I adore him.

10. May Sarveswara Vitaraga, who is the portion of the Bodhisatwa Vajra Pani, left on earth, in the form of a kalas, for the preservation of mankind by that Deity when himself descended for the purpose of relieving the Vajra Acharya named Sarva Pada, be propitious to us all. I adore him.

11. May Gattesa Vitaraga, the form assumed by Manja Deva for a portion of himself in order to awaken the ignorant and idle and sensual Manja Gartho, and convert him into a profoundly learned sage, be propitious to us all. I adore him.

12. May Phanindreswara Vitaraga, the form assumed for a portion of himself by Sarvani Varana Viskambhi Bodhisatwa, that Bodhisatwa desirous of the form of a fish, the wearer of huge serpents as ornaments, and who, having fulfilled the desires of Oriya Acharya, took the form of a fish, be propitious to us. I adore him.

12. The address here (as in the other instances) is chiefly, if not solely, to the Vitaraga: yet it is hardly possible to give unity to it: and the sense and grammar would be improved by putting a "may" before the words "that Bodhisatwa," and so making the address both to the Bodhisatwa and to his individuated portion.

13. As Oriyana covered by his umbrella was performing penance on the banks of the Vachmati, the Bodhisatwa Prithwigarbha suddenly appeared, and established a portion of himself as Gandhesa Vitaraga, the friend of all, and standing in the presence of Lokanatha, may Gandhesa be propitious to us. I adore him.

14. Oriya, delighted at having obtained perfection by his severe ascetic exercises, began, whilst he contemplated the son of Amitabha, to blow the shell. At its sound Khagarbha Bodhisatwa became manifest; that Khagarbha whose heart is obedient to the will of Loknatha, and who having, in obedience to his will, issued from the conch and established a portion of himself as Vakrameswara Vitaraga, departed to his own abode. May Vikrameswara be propitious to us. I adore him.

14. The rendering of this stanza was a matter of some difficulty. Two or three comments were referred to, and the mention of Oriya reintroduced in obedience to the best of them, and to the living authority already alluded to. The "son of Amitabha, mentioned in this stanza is Padma Pani: and the Lokanatha, Avalokeswara, and Abjapani of preceding and succeeding stanzas are different names for the same Deity. He is considered the Lord and Master, in an especial manner, of the eight Vitaragas.

15. May the holy Tirtha Panya where the Saga obta[illegible]d rest from Tarkshya: may the holy Tirtha Santa where Parvati performed penance to allay her domestic broils: may the holy Tirtha Sankaru where Rudra went through severe austerities to obtain Durga, be propitious to us all. I adore them.

15. In this and the subsequent stanzas the fourteen greater Tirthas of Nipal are particularized, and at stanza 20, the four lesser ones are mentioned generally.

They are all frequented at this day, and the legends are to be found in the Sambhu Puran. They are too prolix for extraction.

Panya tirtha is at Gokarna, where the Vachmati and Amagh-Phula-Dayini rivers unite.

Santa tirtha at Guhgeswari ghat, where the Maradarika joins the Vachmati.

Sankara tirtha immediately below the town of Patan, at the confluence of the Vachmati and Manimati.

16. May the holy Raja tirtha where Virupa obtained the sovereignty of the whole earth: may the holy Kama tirtha where the gamekeeper and the deer went to Indra's heaven: may the holy tirtha Mimalakhya, where the Vajra Acharya performed his ablutions, be propitious to us all. I adore them.

16. Raja tirtha at a place called in Newari, Dhantila, where the Raj-manjari runs into the Vachmati. It is just below the Sankara tirtha Kama tirtha called, in Newari, Phúsinkhel, at junction of the Kesavati and Vimlavati. The former is the river which the Goorkhas have taught us to call the Vishnumati, and so for Vachmati we say with them Vagmati. Besides those two, all the other rivers mentioned are mere mountain streamlets. Nirmala tirtha at a place called, in Newari, Biji Soko, junction of Kesavati and Bhadravati.

17. May the holy tirtha Akara, where treasure is obtained by the despairing poor: may the holy Juyana tirtha where the true wisdom is got by the ignorant solely by reverencing the stream: may the holy tirtha Chintamani, where every desire is attained by those duly performing their ablutions there, be propitious to us all. I adore them.

17. Akara tirtha at a spot called in Newari, Kahang, where the Kesavati and Suvarnavati join.

Jugana tirtha at Kadokhu at junction of Kesavati and Papanasini.

Chintamani tirtha at Pachilihvaivi where the Kesavati and Vachmati join. This is the great Sangam of Nipal, where its two chief rivers (they are but puny ones) unite below the present capital.

18. May Pramoda tirtha where ablution secures pleasure: may Satlakshana tirtha whose waters engender auspicious attributes: may

Sujaya tirtha, by bathing in the stream of which Balasura subdued the three worlds, be propitious to us all. I adore them.

18. Pramoda tirtha at Danaga (I need hardly repeat that these names of places are Newari,) junction of Vachmati and Ratnavati. Satlakshana tirtha at Pagakhucha, where the Vachmati and Charumati flow together. Jaya tirtha at Nakhupoa junction of Vachmati and Prabhavati.

19. May the Goddesses Vidyadhari, Akasyogini, Vajrayogini and Hariti: may Hanuman, Ganesa, Mahukala, and Chura Bhikshani: may Brahmani and the rest with Sinhini, Vyagrihini and Skanda be propitious to us all. I adore them.

19. The four first Deities are esoteric Goddesses of the Swobhavika sect. A comment says, "Above the region of air is fire, above fire water, above water, earth, above earth Sumer mountain, above it Surya Mandal. In Surya Mandal is a lotus, out of which, by virtue of Swabhava, Vidyadhari and Akasyogini were revealed, each with her own Vija Mantra." The Swobhavikas usually symbolise these elements or vijas by the letters of the alphabet. The forms of these Goddesses are very much alike, all strictly resembling those of the terrific Goddesses of Brahmanism: and they are all said to be givers of the powers of witchcraft and sorcery to their adorers. The two first are said to be ranked by Amera Sinha with an inferior order of Celestials, and to such an order Hariti must be referred, since she is a Yakshini; but Vajrayogini is a Maha Devi or Goddess of the first order. Hariti's legend resembles that of Sitala, as whom Hariti is constantly worshipped by Brahmanical Hindoos, though her temple is within the very precincts of Sambhu Nath.

Hanuman, Ganesa and Mahakal are names sufficiently familiar to us. Amongst the Deities adopted by Buddhism from Brahmanism, these three are peculiar favourites, because the Bouddha legends justifying their adoption are popular and clever. The proper sentiment of the Saugatas in regard to all these imported Deities is, that they are servants of the Buddhas, and entitled only to "chakar-puja," as a specimen of the legends in virtue of which the gods of Brahmanism have been converted into Bouddha Deities take the following relative to Hanuman. In the Lankavatar it is written that when Rama sent Hanuman to destroy Rávan, Ravan oppressed by the monkey, sought refuge from Sakya in a Vihar. Hanuman unable to violate the sanctuary, went to Rama and told him that he could no farther press his advantage against Ravan, because of Sakya's protection, whose follower Ravan had become. Rama replied 'Go you also and serve Sakya.' In all Sakya's Vihars are to be found the images of Hanuman, Ravan, Mahakala and Hariti. The Swobhavikas invoke Mahakala, under the name of Vajra Vira, as self-existent, whereas the Aishwarikas adopt him *with* his pedigree as the son of Siva and Parvati. Chara Bhikshani, is as her name imports, a female of the mendicant order of Bouddhas. Upon the interesting subject of the classification of their followers by the genuine Bouddha institutes I can only here observe, that though Buddhism is a free and equal association of ascetical saints who know no disparity of rank, save such as each may derive from his own superior efforts of bodily mortification and mental abstraction, yet it has a technical fourfold division of its followers (very similar to that which distinguished the old Monachism of Europe) into Arhans or perfect saints, Sravakas or studious saints, Chailakas or naked saints, and Bhikshus or mendicant saints.

Brahmani and the Matrikas call for no remark. Sinhini and Vyagripini are their servants. The Aishwarika Skanda is in all respects similar to the Brahmanical Skanda: but the Swobhavikas (*more suo*) make him self-existent.

20. May the two great tirthas, the source and exit of the Vachmati: may the four lesser trithas: may the Kesa Chaitya on the Sankhocha hill, the Salita Chaitya on the Jatochha hill: may the Devi of Phullochha hill, and the Bhagavati of Dhyana prochha hill, be propitious to us all. I adore them.

20. The four lesser tirthas are named Tara tirtha, Agastya tirtha, Apsara tirtha, and Ananta tirtha. They are four kunds, situate at Vachdwara.

Saukhocha hill is that which the Goorkhas have taught us to call Sivapura. In Newari, it is Shiphucho. The legend of Kesa Chaitya says, that Krakut Chand Buddha cut off the forelocks (and so made Bouddhas) of 700 Brahmans and Kshetriyas on the spot. Half the hair rose to Heaven, and gave origin to the Kesavati (Vishnumati) river: the other half fell to the ground, whence arose numberless Chaityas in the form of Singas, a small mass of hair becoming in each the "palus" of the Lingakar Chaitya. Lalita Chaitya, says the Sambhu Puran, was founded by the disciples of Vipasya.

Jatachha hill on which it still stands, is the Arjun of the Goorkhas, called in Newari, Jamacho.

The Devi of Phullochha is Vasundhara, under the form of a conical piece of rock: the hill *we* call, after the Gorkhas, Phulchok. The Bhagavati of Dhyana Prochha is a portion of Gukyeswari or Prajna, under the form of a conical stone, the hill the Goorkhas have taught us to call Chandragiri.

21. May the Chaitya of Sri Manja on Sri Manja hill, erected by his disciples: may the five deities established in five separate places by Santasri: may the Puchagra Chaitya, where Sakya expounded the unequalled Purana, be propitious to us. I adore them.

21. Sri Manja Hill is the Western part of mount Sambhu, between which Sri Manja there is a hollow, but no separation. The Chaitya still stands.

The five Deities established by Sata Sri are Vasundhara Devi in Vasupur: Agni Deva in Agnipur: Vayu Deva in Vayupur: Naga Deva in Nagpur: and Sakya Devi in Santipur. All are on mount Sambhu around the great Temple. The legend in the Sambhu Puran says, that Santasri was a Kehstriya Raja of Gour Des, named Prachanda Deva, who abandoned his kingdom, and coming to Nipal was made a Bouddha by Gunakar Bhikshu, with the name of Santasri.

Pachagra Chitya is on the hollow level of mount Sambhu.

22. May the King of Serpents residing with his train in the Adhara lake: may Vighnantaka: may the five Lords of the three worlds named, Ananda Lokeswara, Harihari-hari-vahana lokeswara; Yaksha malla lokeswara, Amoghapasa lokeswara, and Trilokavasankara lokeswara, be propitious to us all. I adore them.

22. The legend is the same with that alluded to in stanzas 6, 7, and 24. The serpent King is named Karkotaka, his realm formerly extended all over the valley whilst it was submerged in water. Now he dwells in a tank near the town of Cathmandu assigned to him by Manja Nath, when Manja, let off the waters that covered Nipal. The Adhara lake or tank is called in Newari, Ta Dahong.

The five Lokeswaras are Bodhisatwas. Ananta is called in Newari, Chobha Deo, and Yaksha Malla, Tuyu Khwa.

23. May the esoteric deities named Hevajra, Samvara, Chandavira, Trilokivira, Yogambara, with their several attendants: may Yamantaka and the other nine Kings of wrath, be propitious to us: may the exoteric divinities Aparimitayu and the rest, Namsangiti and the rest, be propitious to us. I adore them.

23. The esoteric deities enumerated first, belong to the Swobhavika sect. Aparimitayu is in Buddha, and his associates as follows:—

1. Aparimita Gun, Buddha.
2. Guna Ratna Sri, ditto.
3. Aparimita Parti, ditto.
4. Sahasreswara Megha, ditto.
5. Suryottama Prabhasa, Buddha.
6. Vahuvihita Teja, ditto.
7. Asaukheya Kalpa, ditto.
8. Subha Kanaka, ditto.

Namsangiti is also a Buddha, and *his* associates as follows:—

1. Dridha Surya, Buddha.
2. Bhaishajna Guru, ditto.
3. Supuspita, Buddah.
4. Ratna Keta, ditto.

24. May Manja Deva, who having come from mount Sirsha with his wives and two Devis divided the southern mountain with his scimitar, built the town of Manja Pattan for the pleasant abode of the human race, and worshipped the deity sitting on the lotus, be propitious to us all. I adore him.

24. The language, physiognomy, architecture, manners and customs of the Newars clearly prove their Northern extraction, and in the Sambhu Puran, a person called Manja Ghok is distinctly related to have led a colony into Nipal from China: for Sirsha Parvata is said to be situated in China, meaning probably Bhote. The making Manja a Dhyani or Celestial Bodhisatwa is a mere trick of modern superstition. The town of Manj Pattan founded by Manja has perished, but tradition still gives it a locality half way between mount Sambhu and the Paspati wood, and tradition is countenanced by the fact, that at this day quantities of building materials are often dug up on the assumed site of the town.

25. May Abjapani, the chief followed by Hayagriva, Jatadhari lokeswara, and the rest, who came from Sukhavati Bhavan, then proceeded to the mountain Putala, and being thence called by the Raja Deva Huta to remove accumulated evils, was established with many rites in Lalitapur, be propitious to us all. I adore him.

25. Hayagriva (said to be the same with Bhairava) Jatadhari and the rest rea Abjapanis (Padma Pani) warders and menials. The names of the rest are

1. Sudhana Kamara.
2. Ajita.
3. Aparajita.
4. Marsainya.
5. Varada.
6. Akalmritya.
7. Jaya.
8. Vijaya.
9. Abhaya Prada.
10. Dhanada

The Buddhmargy legend here alluded to is not supported by the authority of any of the Bouddha scriptures of Nipal, but rests on mere tradition. Abjapani is universally identified with Padma Pani, the fourth Dhyani Bodhisatwa. The application of the name and attributes of the Yogeswara Matsgendra Nath to this Deity is a corruption introduced by the Siva Margi Newars, and scouted by the Bouddhas in whose hands exclusively is the ministry of Abjapani's idol. The Bouddhas, however, have no objection to the Siva Margi Newars, and even Brahmanical Goorkhas making *offerings* to Padma Pani under any name they please, and in fact, all orders and sects unite in swelling the Yatra or procession of this Deity. The Bouddha tradition says, that upon the occurrence of a dreadful famine, Narendra Deva, a Raja of Bhatgong and Bandhudatta, a Vajra Acharya of Pattan, invited Padma Pani to Nipal. A quaint distich familiar to the learned Bouddhas fixed the date of Padma Pani's arrival at 1382 years from the present time. This subject is worthy of more attention than I have yet given it. By due pains (and they shall not be wanting) I hope to procure hereafter some written account of this event.

Notice of two Marmots inhabiting respectively the plains of Tibet and the Himalayan Slopes near to the Snows, and also of a Rhinolophus of the central region of Nepal. By B. H. Hodgson, Esq.

1. *Arctomys Himalayanus* of Catalogue. Potiús, *Tibetensis* hodie. Mihi. Structure typical. Tail not exceeding in length one-fourth of the body and head. Molars five-four, first above unicuspide and cylindrical in its body and tuberculous on the crown: the rest double, low, flat and rather hollow crowned, but with a slight heel on the inner extremity (towards the tongue,) and a groove between two transverse ridges towards the cheek. Pelage of two sorts; hair and wool: hair the more copious, straight, elastic, adpressed, rather harsh, an inch one-

eighth to one and a quarter long: wool wavy, a third less long, not found on the body below, or tail, or head, or limbs. Hair triannulate from the base, with dusky brown and yellow (of a canescent rather than rufescent cast) and black, the last ring much the shortest, and found only on the upper surface of the body: the woolly fur biannulate only, wanting the dark tips of the hairs. General external hue, a sub-rufescent cat-grey: beneath from chin to vent yellow: limbs and cheeks the same, but deeper toned and inclining to rufous: bridge of nose and last two inches of tail, dark brown. Twenty-two to twenty-four inches from snout to vent: tail with the hair, five and a half to six and a quarter. Palm and digits (exclusive of the nails) three and a quarter: Planta, ditto ditto, three and six-sixteenths. Sexes alike, and of nearly equal size.

Habitat Tibet. Social and gregarious.

2. *Arctomys Hemachalanus*, Mihi, Structure typical, but the digits furnished with a basal membrane. Tail exceeding a third of the length of the animal. Molars five-four, the firs tin upper jaw as in the last: the rest transverse and having their broad crowns sulcated round a horse-shoe ridge, in lower jaw cupped between four tubercles placed at the angles of each tooth. Pelage softer and fuller than in the above, of two sorts, or hair and wool, and nearly in equal quantities. Hairs straight, fine, elastic, and about one inch long: wool wavy and two-thirds only the length of the hair. Both hair and wool triannulate from the base with dusky, rufescent, and black, and nearly in equal proportions, the dark tips being ample wherever they exist, that is, on all the superior surface of the body and head, but not on the belly, nor limbs, nor sides of the head, nor ears; general colour dark grey with a full rufous tinge which is rusty and almost ocherous red on the sides of the head, ears, and limbs, especially in summer. Bridge of nose and last inch of the tail dusky brown. Head and body above strongly mixed with black, which hue equals or exceeds the pale one on those parts. From snout to rump twelve to thirteen inches. Tail five and a quarter to five and a half. Palma, less than the nails, two and three-sixteenths. Planta, ditto ditto, two and fifteen-sixteenths. Sexes alike, and of nearly equal size.

Habitat the Himalaya with the Bhote pergannahs or Cachâr in the immediate vicinity of the snows. Social and gregarious.

Remarks.—I cannot doubt that the above two species are distinct, because the Trans-Hemalayan animal is nearly twice as large as the Hemalayan, and possesses a proportionately much shorter tail, not to dwell on the difference of habitat, which however seems to be invariable. In structure and in manners the two species, for the most part, correspond entirely, and the difference of colours is chiefly in intensity of hue.

Many years ago I possessed, alive, a specimen of the larger or Tibetan species of Marmot, which was as tame as a rabbit, and lived at large in the house. I have lost my notes on it, but recur to the fact, lest any one should tax me with multiplying species incautiously. I cannot now doubt, on full consideration, that the larger and lesser species are distinct; and I may add, that in my old specimen of the larger one, the crowns of the cheek teeth are nearly levelled by attrition. I have recently had two or three of the lesser species alive for months in my garden. The last lived above a year and quarter with me, when it died of an accidental wound. These individuals dwelt together in amity, were very somnolent by day, more active towards night and in warm weather, but did not fall into a permanent sleep in the cold season, perhaps because they were regularly exposed to the sun in the day time. They were fed on dry grains and on fruits, such as pears, pomegranates, and plantains. They slept rolled into a ball and buried in the straw, with which their case was amply supplied. Over their meals they would frequently chatter a good deal in a very audible tone, but were usually quite silent. They were very tame and gentle for the most part, but would sometimes bite and scratch like rabbits, uttering a somewhat similar cry. On foot they are by no means active, though more so than the Rhizomys. Nor are they very prone to digging, but will slowly excavate a subterrene abode for themselves if permitted. Their structure is plantigrade, but of the ambulatory, not fossorial or scansorial modification of that type; and, whilst their massive heads and jaws and powerful incisors indicate immense power in reaching, as well as masticating their food, their talons exhibit no development of the pre-eminent digging type. The following particulars of the external and internal organization of the lesser species will probably prove acceptable to the real students of Zoology. Head large, massive, conico-depressed, with eyes and ears equally and considerably remote

(1⅝ inch). Culminal line of the head considerably arched along the nasal bridge, at the end of which the curve is lost in the prominence of the orbits, and subsequently in the fatness of all the cerebral part of the head, muzzle nude in front only, and not grooved. Upper lip not cleft, but full and incurved to the sides, so that the inside or palate is partially hairy. Lower lip very short and adpressed, nares short, ovoid, scarcely angulated or turned to the sides. Incisors very strong, white, rounded anteally, the upper pair directed nearly downwards, the lower pair forwards in a small crescented curve from the bases, where a large mass of gland is found on dissection, but no cheek pouch. Molars five-fourths, the first above unicuspide, and furnished with one tubercle on the subconic crown: the rest with broad transverse crowns, either cupped between four tubercles at the corners, or sunk within a horse-shoe ridge, the ends of which point to the cheek. Mustachios longish reaching to ears, not rigid, but very elastic. A similar but smaller tuft on each cheek, and above and before each eye, and others still smaller on the chin and behind the carpus, as well as before it or in front of the arm. Eyes medial, midway from snout to ear, pupil oblong. Ears small, erect, rounded, as broad at top almost as below, and very simple in structure, or devoid of all membranous processes. Helix inflected anteally, but not fissured posteally, and moderately clad, inside and out, as far down as the conch, the longest hairs forming a fringe along the upper margin, but *not* so that the ears can be called tufted. Body full, moderately elongated: limbs medial, plantigrade, ambulatory, of moderate subequal strength before and behind. Fore-arm about as long as the hand, including the wrist and nails. Palm wholly nude, soft, pretty full with two large subtrigonal basal or carpal pads, the inner of which supports and envelopes the rudimentary thumb, which has however its tip free and furnished with an andromorphous nail. There are three round terminodigital balls for the four fingers which are gradated as in man's hand, but have their bases connected by a distinct crescented membrane. Behind the digits are about as long and as stout as before, and are similarly connected by membrane, but the fifth digit or thumb is here fully developed and free, as long proportionately as in our hand, but rather feebler than the other digits, and having like them an anteal, not antagonistic position. The sole is nude to the heel, and about twice as long as the longest digit, soft and smooth, with four proximate roundish balls for the bases of the five digits, and two small vague ones for the metatarse placed subcentrally as to the entire length of the planta, and transversely in the same line. The tail without the hair is about half the length of the body without the head. It is not thick at the base, and thence gradually tapers, being rather fuller of hair than the body, and the hair exceeding the tail itself by about one inch, where it forms a blunt termination.

The anal and genital parts are void of any peculiar glands or pores. In the females the teats are twelve, and extend from the armpits to the back of the groins. In one specimen I find but ten mammæ: the larger species has twelve decidedly. The talons have the general character of those of our *Mesobema*, [olim *Urva*], being of medial subequal size, hardly larger before than behind, moderately compressed, rounded above, and scooped below towards their blunt extremities. The intestines in one specimen (female) measured ten feet and four inches: in another (male) eight feet and a half, and in the former the stomach along the greater arch was five inches and a half, and along the lesser two inches, while in the latter it was only four by one and a half. In the female, whose intestinal canal was ten-four, the cæcum was found at three-two from the anal, and was two inches long by one and a half in diamater, cylindric in shape and curved lunately as it lay in situ. The larger gut was one inch wide, and the lesser half that width. The stomach was purely membranous and (as flatted on a table) of an attenuate pyriform shape, having the upper orifice terminal, and the lower remote from it, but so as to leave a good sized fundus.

N. B.—There is a prior description of the large Marmot in the Journal, Vol. X, p. 777.*

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* In Mr. Ogilby's 'Memoir on the Mammalogy of the Himalayas,' published in Dr. Royle's Volume on the Botanical productions of that immense range, we read that — 'Dr. Falconer, in the report of his recent journey to Cashmere and Little Tibet, mentions a rodent under the name of the Tibet Marmot, which he says was first found on a bleak and rocky tract of country, immediately after passing to the northern slope of the great Himalayan range; but we have no further knowledge of its characters: however, this is precisely the locality in which mammals of this description might naturally be expected to abound.''

It is not improbable that the *Lepus hispidus*, Pearson, described in the 'Bengal Sporting Magazine,' as quoted by Dr. McClelland in *Proc. Zool. Soc.* for 1839, p. 152, should also be referred to this genus: I hope to be soon able to procure specimens of it.—*Cur. As. Soc.*

3. ***Rhinolophus Perniger***, Mihi. Structure typical. Inguinal teats, distinct large cup-shaped frontal sinus. Tongue considerably extensile, fleshy, full, smooth anteally, subpapillate towards the gullet, noseplate spreading amply to sides, and exceeding the edge of the upper lip, flat and free all round the margin, merely membranous, furnished with two salient processes, whereof the lower or anteal one is like a door-knocker, and the upper or posteal, a graduate spire. Ears very large, much longer than the head, shaped like a broad acutely pointed leaf, transversely striate, nude save at base, their fine points slightly drooped; the false or inner ear semicircular in form, and anteally much attached to the cheek, so as to fold over the orifice of the auditory passage, where it doubles upon the anteal part of the helix. Tail six-jointed, shorter than the body, and its full membrane squared nearly between the spread radii or metatarsal processes. Wings ample: thumb free and furnished with a nail: first finger one-jointed and no nail; the rest three-jointed and unarmed. Fur longish, very soft, lax and slightly curled. Colour uniform black, embrowned on the nude cutaneous parts, slighted tipped with silver on the back. Snout to rump three inches and a quarter (female,) tail two and one-eighth; head one and five-sixteenths, expanse seventeen; ears from anteal base one and eleven-sixteenths, from the crown of the head or posteal base one and six-sixteenths; fore arm two and five-eighth; second or longest finger four; leg or tarse one and three-eighth; foot from os calcis to end of talons thirteen-sixteenths.

Habitat, the central region of the Sub-Himalayas: shy: never approaches houses or the cultivated country: dwells in the deep forests and caves of the more precipitous mountains. [Mr. Hodgson has sent some other spicees of this genus, with descriptions; but as the Society expects shortly to receive from Europe M. Temminck's Monograph of the *Rhinolophi*, I deem it better to await the arrival of that treatise on the group, before venturing to determine Mr. Hodgson's and some other species of Horse-shoe Bats in the Museum.—*Cur. As. Soc.*]

Nepal, February, 1843. B. H. HODGSON.

Proceedings of the Asiatic Society.

Wednesday Evening, 3rd *May,* 1843.

The Honourable W. W. Bird, President, in the Chair.

Captain Goodwyn and Lieut. Strachey, of the Corps of Engineers, proposed at the last Meeting, were ballotted for and duly elected Members of the Society.

Ordered.—That the usual communication of the election be made to Capt. Goodwyn and Lieut. Strachey, and that they be furnished with the rules of the Society for their guidance.

Messrs. Brandreth and Cust C. S. were proposed as Members of the Society by the Honourable the President, seconded by Sir W. H. Seton.

Library.

The following Books were laid before the Meeting :—

Books received for the Meeting of the Asiatic Society, on the 3*rd May,* 1843.

The Oriental Christian Spectator. Bombay, April 1843. Second Series. Vol. iv, No. 4. Presented by the Editor.

Proceedings of the London Electrical Society, 1842-3, pts. 5th and 6th. Presented by the Society.

London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science. 3rd Series. December 1842. Vol. xxi, No. 140.

Annals and Magazine of Natural History. London, November 1842. Vol. x, No. 64.

Statistike Tabeller for Kongeriget Norge 1er till 5e. Reekke irreg. (Tableaux Statistiques sur la Norvège. Série 1er,-5e.) Presented by the University of Christiania.

Nyt Magazin for Naturvidenskaberne 11 Hefter (Nouveau Magazin pour les Sciences Naturelles, publieé par la Société Physiographique á Christiana, 11 Cahiers). Presented by ditto ditto.

Lærebog i Mechaniken of Chr. Hansteen, 2 bande, (Cours complet de la Mechanique, par le Professeur C. Hansteen, 2 tomes). Presented by ditto ditto.

"Heimskringla" eller Snorre Sturlesons Norske Kongers Sagaer med 3de, Karter og fure Slaalsteb, (Chroniques des Anciens Rois de la Norvège, par Snorre Sturlesons, édits par T. Aall, avec Cartes et beaucoup de Planches). Presented by ditto ditto.

Abels Varker, 2 bande, (Œuvres complètes du Mathèmaticien Novègien, N. H. Abel, redigeès par ordre du Roi, par le Professeur B. Holmboe). Presented by ditto ditto.

Descriptio Ornamentorum Aureorum et Nummorum in Norvegia Repertorum, 1825, scripsit C. Holmboe. Presented by ditto ditto, (2 copies).

De Nummis medii Aevi, in Norvegia nuper Repertis particula Posterior, 1837. Presented by ditto ditto.

Aarsberetning for det Kongelige Norske Frederiks Universitets for Aaret 18 (Annuaire de l'Université, 1840). Presented by ditto ditto.

Norges Statistik af Schweigaard. 1st deel, (Statistique de la Norvège, par Schweigaard, tome 1er). Presented by ditto ditto.

De Mutationibus Virgæ Magneticæ, Auctore Christophoro Hansteen, 1842. Presented by ditto ditto.

Index Scholarum in Universitate Regia Fredericiana, 59 ejus Semestri, 1842. Presented by ditto ditto, (2 copies).

Gaea Norvegica, 1838, Earstex Heet. Presented by ditto ditto.

Universiteterne i Christianas. Upsala, 1836. Presented by ditto ditto.

De Prisca re Monetaria Norvegiæ, scripsit C. A. Holmboe, 1841. Presented by ditto ditto.

Indby Delsesskrift i Anlidning of den Höitidelige Nedlæggelse of Grundstenen til Nye Byginger for det Kongelige Norske Frederiks Universitet Trediveaarsdagen efter dets Stiftelse den 2den September, 1841. Presented by ditto ditto.

Read letter from Mr. Officiating Secretary Davidson, No. 48, of 12th ultimo, communicating the acknowledgments of the Government for the offer, by the Society, of copies of a Sindee Vocabulary about to be published under its superintendence, and stating, that twenty-five copies of the work would be sufficient for the use of Government.

Read letter from Capt. H. M. Durand, Private Secretary to the Right Honourable the Governor General of 8th ultimo, informing the Secretary that His Lordship would wish twenty-four copies of the Sindee Vocabulary to be sent to the Government of Bombay, the like number to the Secretary in the Political Department with the Governor General, and one copy to Major Leech, C. B.

Read letter from N. B. E. Baillie, Esq. of 24th ultimo, accepting the office of Member of Committee of Papers, and promising to render every assistance in his power to the best of his ability.

Read the following letter from Mr. R. S. Maling, of 2nd ultimo, presenting specimen of some Oil extracted from Nuts, the produce of trees called by the Natives Nipal Ukrote.

Dear Sir,—I beg to forward herewith a small quantity of Oil extracted from Nuts the produce of trees called by the natives Nepal Ukrote, of which I have some few in my compound. I am unable to give you the real name of the tree, but in order that you may discover it, I send you, accompanying, some of its leaves and blossom, also some of the nuts it bears. The leaves so far as I can recollect, are precisely similar to those of the Sycamore, and the tree itself resembles it very much, so far so indeed as to lead me to suppose, (until I observed the nuts it bore,) that it was the Sycamore tree. From enquiries that I have made, I learn that the full grown trees I have were planted by Mr. Clerk of the Civil Service, some 28 or 30 years back; they flourish well here, and are of speedy growth. I planted some last rainy season, which are already five and six feet high, the tree itself is ornamental, and to shew how profitable a plantation of them would be if cultivated for the sake of the oil, I annex the following :—

Say, 40 Trees upon each Beegah, ...	40
Each Tree averaging 1½ maund of oil,....	1½
	60
Such oil would fetch at the least even in Calcutta, 12 Rs. per maund.	12
	Rs. 720 each Beegah,

from which must be deducted the cost of manufacture, which, however, would in all likelihood be paid for by any crop on the same ground, such as Indigo, Mustard, &c. &c. I extracted the oil sent you by pressure, in a manner exactly similar to that in use in the manufacture of cold drawn castor oil; the nut itself I have eaten, and found very palatable, far more so I think than the walnut, and I never experienced any bad effects from eating it. The natives say it is a purgative, but I did not find it so. At the present season the tree is particularly handsome, being covered with a handsome white blossom, which contrasts well with the large dark leaf of the tree. It is my intention to send some of the young plants I have to the Agricultural Society, and I shall have much pleasure in sending you as many young trees, and as much seed as you may require.

Yours very faithfully,

Baugundee, 2d April, 1843. W. Maling.

P. S.—You will not fail to observe the remarkable difference between the leaves attached to the blossom, and those separate, and yet they are off the same tree.

Read the following Letter and Memorandum from Captain Macleod, of Moulmein, of 10th ultimo, on a specimen of Black Dye, of which samples were on the table :—

My dear Torrens,

The accompanying will speak for itself, the black colour conveyed by the Dye is the most beautiful I have seen. I would write more on the subject, but the letter and the Dye have just reached me, and I fear to delay, the Steamer being on the point of starting.

Yours very truly,

Moulmein, 10th April, 1843. W. Macleod.

Zimmay, February, 1843.

"I have the pleasure of sending you a specimen of the Black Dye. I made the experiment myself, and find it is produced from the pulp growing round a kind of plum of a very light colour inside, until broke, exposed to the air and sun, when it gradually assumes the intense Black Dye, and becomes insoluble in water, and must go through the same process as Indigo, both being insoluble in water. The manner of dying silk is very simple; it is immersed in a quantity of the pulp mixed with water sufficiently thin, and either dipped or rolled over the silk which immediately being exposed to the sun grows darker, and if not sufficiently dyed, this is repeated; it requires but a small quantity to dye a quantity of silk.

I shall bring down with me a piece of Long Cloth I have had dyed; the process of dying cotton is different, it is first put in a solution of Indigo, dried, and then immersed and exposed to dry, becomes entirely black. The natives keep the Indigo in solution; with it is mixed a great quantity of lime; no boiling or hot water is used in the process. Should you have an opportunity, send the specimen to the Society in Calcutta in my name, and I will bring a box down to be sent to England, as well as some Indigo; and enquire of them, if there is any premium for the production of a Black Dye that requires no sulphate of iron.

Read the following letter from Professor Holmboe, of the university of Christiana.

Christiana, le 21 *Sept.* 1842.

Messieurs.

Les Directeurs de la Société Asiatique de Calcutta.

Etant informé par mon compatriote Mr. Bonnevie, que Messieurs veiulent bien vous mettre en rapport avec notre Univérsité afin d'échanger des articles scientifiques, je prends la liberté d'envoyer ci-joints 215 monnoies, dont les 160 sont de la maison d'Oldenbourgh, non plus en cours, et les 55 des monnoies du 12me siecle reçemment découvertes, sur lesquelles j'ai publié un mémoire, dont un exemplaire est aussi ci-joint.

Possedant dejà plusieurs des monnoies, que les Anglais ont fait frapper pour les Indes, il nous serait particuliérement agréable de recevoir des pieces frappées par les princes indigénes. Sur tout il nous interesserait beacoup de recevoir de celles, qui passent sous le nom de Indo-scythiques ou Indo-bactriques, et dont Messieurs Masson et Honigberger ont trouvé de grandes quantités dans l'Affghanistan.

Veuillez agreér l'assurance de la parfaite considération, avec laquelle ja'i l'honneur d'étre,

Messieurs,
Votre trés humble et trés obéissant serviteur,
F. Holmboe,
Professeur des Langues Orientales à l'Université Royale de Christiania, et Directeur de son Cabinet de Médailles.

Read the following letters, giving cover to papers for publication in the Journal of the Asiatic Society; viz. of 21st April, from Mr. Officiating Secretary Davidson, with a Report by Mr. Commissioner Lushington, on the results of the mining experiment conducted at "Pokhree in Gurhwal."

Of 15th April, from Capt. H. M. Durand, with a brief History of Khelat, by Major Leech, C. B., and a Journal of a Tour through parts of the Punjab and of Affghanistan, by Agha Abbas of Sheraz, arranged and translated by Major Leech, C. B.

Of 11th April, from E. C. Ravenshaw, Esq. C. S. with a memorandum on the construction of a "Portable Meridian," ordered to be published accordingly.

Read letter from Mr. James Reynolds, Secretary of the Oriental Translation Fund, dated London, 14th February 1843, requesting remittance of the subscription of the Asiatic Society for 1842 and 1843, amounting to £21.

The remittance ordered to be made by a set of bills.

The Secretary presented to the Society sundry Fire Arms of the manufacture of Lahore, Cabool, and various places of Hindoostan, being as follows :—

Dokh, or Hindoostanee cut-and-thrust Sword.

Two Peshawur Firelocks, mounted after the Native and English fashions, lock made by Cashmeeree Gunsmiths of Loodiana to imitate Tower locks.

A Gun.

A Lahore Matchlock, purchased from one of Runjeet Singh's *Ghorchurras*.

Knife used by the tribes about the Khybur Pass, as Afreedees, Momunds, &c.

A small box, containing some dust of the Sandal-wood gates of Somnath was also presented, and examined by the Members. The impression was general, that the gates were really of Sandal-wood. A copy of the Inscription and the Report of the Committee of Engineer Officers had been sent with the box, but had been sent off for early insertion in the Journal without any copy being retained. The drawing of the gates had not yet reached the Secretary's hands. The subject was therefore ordered to be again brought to notice at the next Meeting.

Read the following Report from the Curator of the Museum of Economic Geology, for the month of April last:—

Report of the Curator Museum Economic Geology for the month of April.

Museum Economic Geology.—We have completed searching out and arranging our Indian Copper Ores, and the collection comprising 72 specimens from Kemaon, Gurhwal, Nepal, Shekawattee, Ajmere, Nellore, and Ramree is now upon the table. Much is yet wanting to complete this series, but we shall no doubt soon receive contributions. Mr. Commissioner Lushington's report on the Government experimental working of the Kemaon mines, which is presented this evening from Government, is a highly valuable record for future guidance, but we may remark upon it, that the outlay and the depth penetrated are trifling when compared with mining adventures in Europe, so that rich beds or veins may still remain to be reached by future adventurers in this locality.

Mr. Blundell, Commissioner, Tenasserim Provinces, has sent us an interesting paper, with specimens, being an analysis by Dr. Ure of London of the Magnetic Iron Ores and Limestones of Tavoy, which are upon the table. His letter is as follows :—

Moulmein, 7th April, 1843.

My dear Sir,—Having last year sent home some specimens of the Iron Ores of these Provinces, I have lately received a chemical analysis of them by Dr. A. Ure, and thinking they might prove acceptable in the Museum of Economic Geology, I now beg to forward to your address, a box containing similar specimens.

Inclosed is a copy of the memorandum which accompanied the specimens I sent to England, and of Dr. Ure's report on them.

The box is on board the Honorable Company's Steamer *Hooghly*, and will be delivered to you by Captain Ross.

Yours truly,

G. H. Blundell.

From Captain Newbold, M. N. I. Assistant Commissioner of Kurnoul, we have to acknowledge a specimen of a remarkable barren soil from that part of Southern India, the label to which best describes it.

Jairi Soil from Kurnoul, infertile, very impervious to water, used for flat roofs of native houses in Kurnoul as a protection against rains.

I have not yet been able to examine this soil, but it is remarkably like one from Cheduba brought by Captain Halsted, also quite infertile, and is probably like it, rendered so by being almost a pulverulent Iron Ore, rather than a soil.

Geological and Mineralogical.—We have received from the University of Christiana, in addition to several valuable works noticed in the Librarian's report, a small but valuable series of Fossils and Geological and Mineralogical Specimens, in all 50 in number, which are on the table. Of these, the Fossil and Geological Specimens are entirely new to our collection, but some few of the Mineralogical ones we already possessed. It is to the exertions of Captain Bonnevie of Tirhoot, a member of that University, that the Society is indebted for this very handsome donation, which it will be our duty to return in the best manner we can, and by the earliest opportunity. Captain Bonnevie's letter is as follows:—

To the Secretary of the Asiatic Society, Calcutta.

Sir,—It is about nine months since, at the suggestion of Mr. Blyth, I wrote to the University of Christiana in Norway, proposing an interchange of natural productions and scientific works between that body and the Asiatic Society. I have now the honor to enclose a letter, with accompanying lists of articles sent by the University, and beg to inform you, that the packages shall be forwarded to the Society immediately on their arrival.

I have been requested to inform the Society, that in the list of minerals, the "Acmite" Crystal, No. 35, is now very scarce, as the spot where it is found is becoming exhausted, and also, that the specimen of "Gadolinite" No. 44 is of great value. It is a very rare production, and mostly found in small pieces mixed with other substances.

The University would feel very gratified to receive in return any minerals or rare fossils peculiar to Asia, and if procurable, Casts in Gypsum of the cranium of the Sivatherium and other fossil animals of the like kind that have been discovered in this country.

In the lists of books, you will observe a work styled "De Mutationibus Virgæ Magneticæ," by Professor Hansteen. I have been requested by him to suggest to scientific men in India, to make as many observations as possible on the dip and the variation of the Needle. As the suggestion of a learned and influential body like the Asiatic Society will have weight, when those of a humble individual like myself would be deemed presumptuous; perhaps the Society will be kind enough to assist the Professor by urging these observations on its numerous scientific members scattered over India.

I have the honor to be, Sir,
Your most obedient servant,
C. S. Bonnevie.

Rungpore,
The 19th February, 1843.

Mr. Frith has kindly sent us a curious specimen of Wood reduced to brown Coal and Lignite, which was taken from a well now digging at Dum-Dum by his father.

H. Piddington,
Curator, Museum Economy Geology.

For all the Presentations, the thanks of the Society were accorded.

JOURNAL

OF THE

ASIATIC SOCIETY.

Extract from Note Book regarding the Genus Paussus. By Capt. W. J. E. Boyes, *6th Light Cavalry, Assistant to the Commissioner Kemaon and Gurwhal, with four Plates.*

[We have, from press of matter and other causes, been hitherto unable to do justice to Capt. Boyes' valuable and interesting communication: not the last we hope from his pen on a subject so little known, and of such boundless extent as Indian Entomology; and those who know the difficulties attending the creditable execution of delicate plates by native artists, will we trust, as well as the author, make due allowances for our anxiety that his beautiful labours should not be marred in our hands.—Eds.]

Having observed that the genus Paussus among the Coleopterous Insects, has been placed with the Tetrameræ in every work on Entomology it has hitherto been my fortune to peruse, I am induced to forward to you the accompanying extracts from a note book which I have kept some time past, in hopes that the observations therein cited, may induce others more competent than myself to observe, and perhaps assign what I conceive might be a fitter place to the above-mentioned Genus.

Stark in his Natural History, correctly states, as far as I can vouch from my own experience, that the number of joints in the tarsus of the Paussus is five; which circumstance alone, should, I imagine, have proved a sufficient reason, for the removal of this Genus from the Tetramerous to the Pentamerous section of Coleopteræ; but as it will be observed from the following notes, that in addition to its general form, which in outward appearance approximates to many of the Carabici, that it is also, similarly with several of the latter genus, endowed with the faculty of crepitation, attended with the same results observable in many of these, their removal may (I think) well be warranted from the place they now hold to somewhere in the vicinity of Aptinus or Brachinus

Regarding their form, it may be noticed, that the head is generally narrower than the thorax, or at most of the same width, eyes prominent, mostly reniform, sometimes ovaliform or gibbous; the body when viewed from above appears oblong, with the elytra either of one breadth throughout, or narrowed anteriorly, depressed and truncated posteriorly in most species; those which have the elytra of a uniform breadth, curved or sub-cylindrical above, present a rounded emargination to the wing cases at their latter extremities. The palpi though small, are salient, the labial ones being subulate; those of the maxillaries appear composed of four joints, of which the first is thicker than the rest; they differ from the labials in being arched from about midway, turning inwards until their apices are so approximated, that they appear to meet.

The abdomen is oblong, oval and tumid at the posterior extremity, sometimes of one breadth throughout, but more generally narrowed anteriorly. The femur in each fore-leg presents in many species a longitudinal and rather deep sulcus, which when the leg is contracted admits the tibia. The tarsus is composed of five joints, of which the first, though very minute and nearly concealed beneath the spine of the tibia, is still very distinguishable with a magnifier, particularly when the insect is in motion. The thorax resembles the form which obtains in that part of most of the Carabici, being generally cordiform, truncated posteriorly, with margins produced, though some species have it angulated in front and irregular.

In flight, the Paussi are exceedingly easy and agile, the lower wing when expanded being in comparison to the size of the insect of large dimensions, and when they alight, the movement is so sudden, and the elytra are closed so instantaneously over the lower wings, that they appear as having dropped down to the spot on which they rest, and where they generally remain several seconds previous to again attempting to move; facts which I have also remarked as practised by many Carabici. Its walk, however, entirely differs from that of this last mentioned genus, for instead of being nimble and occasionally rapid, I have never seen it moving but in a slow and sedate manner, at which time the antennæ are extended to the front of the head, and to these is occasionally given an upward vibratory motion. What should bring these insects in nearer conjunction with the genus Carabus is the curious fact, that on being seized they emit from the anus a very acrid liquid, accompanied by an explosion, and attended with a strong scent resembling that produced by Brachini, and other allied genera when similarly treated; and although in minuter quantities, it is abundantly sufficient to produce a very sensible heat, and the crepitation may be distinctly heard and felt. Wherever the skin has been subjected to its action, discoloration immediately ensues of a reddish brown color, which soon after turns to a brownish black, resembling the stain produced by the touch of caustic, and which remains permanently fixed for many days after.

The explosion is occasionally repeated three or four times successively, at which periods a vapor may be observed to accompany each crepitation, attended with a strong, and very penetrating odour, something like that of nitric acid.

In one species I possess, the last segment of the abdomen is provided with two large bundles of hairs, resembling densely set brushes, which under the microscope are objects well worthy of examination; each hair appears like a fibre of golden-colored glass, and so closely are they arranged, that it is only on being disturbed that their true character can be discerned; yet notwithstanding the aid afforded by the movement, the hairs composing this curious appendage are only so far separable as to appear like a wetted painting brush. In another insect of the same genus, and probably differing only from the above-mentioned one in sex, the abdomen beneath, near the penultimate segment, is provided with two curved spines in addition to the hairy protuberance already noted. In a third, the posterior end of each elytra gives support to a moveable incurved spine, projecting over the last segment of the abdomen, and which when submitted to the microscope, appears strongly accuminate, and somewhat in the form of the extremity of a scorpion's sting.

In addition to these curious organs, several species are provided near the exterior margin of the elytra, at the posterior extremity, with a small papillaceous follicle, giving cover to an elongated appendage of the same description, which is attached to the upper exterior margin of the abdomen, and which by the aid of a pin's point may be lifted up, and in a slight degree outspread, but collapsing immediately the impediment is removed. It would be difficult to assign reasons for the different addenda in the form of these insects, and observation alone can afford a clue to their uses, but that they are objects of extreme utility, and perhaps absolutely necessary in their economy as is easily to be conceived. Possibly the last mentioned appendages may be a source of further protection granted these curious insects, which are brought into play as danger may threaten; for in one I captured on the night of the 30th ultimo, and which flew into the lights on the table, I observed that when placed under the microscope, if these papillæ were touched, that they possessed the power of discharging a yellowish milky liquid, resembling pus in consistency, and which speedily overspread the lower part of the elytron, granulating into small egg-shaped grains. On repeating the irritation the same results occurred, and in order to be certain of the fact, I tried each elytron twice with the same effect. In my first trial the emission was so sudden and took me so much by surprise, that viewing the insect through the medium of the microscope, I fancied it sufficiently near to be injurious, and incontinently let it fall. I should mention, that in all these trials, each emission was accompanied with a faint acidulous odour. Although the appearance of each discharge obtained on the elytron, I am inclined to believe, that properly speaking, it issued from the foliaceous appendage on the abdomen, and that it spread over the wing case in consequence of the peculiar shape of the shards at the part which overlaps the extremity of the above-mentioned organ, but my experiments were unfortunately closed, ere I could satisfy my doubts, as my servant in removing the microscope to another table contrived to lose my specimen; since which I have been unsuccessful in making a recapture. At one time previous to my loss, I was inclined to believe that a minute perforation existed in the exterior angle of each elytron, with margins sufficiently elastic to allow the liquid to pass through, closing immediately after the emission, but I could not bring myself to any certainty on this point.

After capture, the Paussus may be made to lose its powers of crepitation by too much irritation, at which time it will resort to a very common *ruse* practised by many insects, and similate death, contracting all its legs towards, but not close to, the abdomen, in which position it will remain so long as it continues to be disturbed. This circumstance, as far as I have hitherto noticed, is not a common practice among the Carabici, though very generally adopted by almost all the Heteromeræ.

I may here observe, that many of the latter section of Coleopteræ possess the power of forcing out a very caustic liquid, which exudes from the pores of the abdomen, and at the joints between the femur and tibia of each leg, a practice commonly resorted to when they are being seized. This liquid stains the skin wherever it happens to touch, to a purplish black, remaining on the part for many days after; and so corrosive is its nature, that it is only when the epidermis peels off, that the stain is removed. If plunged in hot water, a strong emission takes place from the anus, and the water is discolored to a purple, or ink black, according to the number of insects used, or requiring to be killed. In a similar treatment of a Paussus, a crepitation may be heard, and the abdomen becomes greatly distended, probably by rarefaction of air contained in vessels which give their assistance in its explosive powers, and the part retains the inflated appearance until a small perforation has been made in it with a needle's point, or such like instrument, which allowing the escape of the confined air, enables the abdomen to contract to its natural size. The same fact is peculiarly remarkable in many species of Brachinus.

Regarding the habits of the Paussus, my experience can give little or no aid, for of the seven species which I possess, one was captured on a heap of manure while searching for Slaptryini at Mhow in Malwa; a second came accidentally into my net while sweeping in some high grass at Sultanpore, Benares; three species were taken at night, generally between the hours of nine and ten P. M., having been attracted by the light on the table; another was rescued from the clutches of a small black ant, which circumstance I notice merely, because a belief exists, that the Paussi inhabit ant-hills, and the last was found crawling up the wall of my bathing room, from which the only conclusion I can arrive at is, that they are most frequently on the wing at a late hour of the night, and as noted in my memoranda, generally after rain. I now proceed to give the extracts alluded to, just as they stand, together with drawings, from which the accompanying sketches have been taken. The originals being colored, I have preferred doing the copies in outline, that a lithograph might be the more readily and correctly produced, should this article be considered worthy of publication. The original drawings have in all instances been taken from the living insect, and which I shall be happy to forward if required. In the two first, Nos. 1 and 2, the minutiæ were not alluded to, and being at some distance from my collection, I regret I am at present unable to give any delineations of their forms; latterly, having taken greater interest in the genus, more has been done, and it now only remains with me to assure you, that in the facts and experiments cited, I have always leaned to the doubtful side, and I therefore trust, that the errors which have crept in, (either as regarding the characterizing of my specimens, or the conclusions I may have arrived at,) will receive the indulgence an unpractised hand may merit.

No. 1. *Fig.* 1.—*Mhow, July* 19, 1839.—Genus Paussus, length 7-20th of an inch, body brown, deeper in the middle of the elytra. Antennæ of two joints, of which the last is large, cuspiform, and having dentated edges with a scallop between each tooth, apex rounded exteriorly, basal angle produced, accuminate and forming a tooth at the end of the superior margins. Lower portions carinated, front view resembling the bows of a boat, head light brown, rounded posteriorly, emarginated in front, sunk nearly to the thorax, and bearing a minute depression in the centre of its upper part in the form of a diminutive horse-shoe. Eyes round when viewed from above, reniform when seen in flank. Thorax sub-octagonal, with rounded margins anteriorly, angulated and scolloped at the corners posteriorly, bisected in its centre, the posterior portion bearing a strongly produced emargination, which crosses transversely in the form of a bracket. Tarsi simple, cylindrical, the last longest, the first very small, almost invisible, of five joints in each leg, all of which are furnished with hairs beneath. Elytra truncated posteriorly, of a uniform width throughout, slightly depressed, body oblong, flattened, palpi conical, not very salient, maxillary ones tumid at base and over-arching the labials. Taken on a heap of manure at Plassie near Mhow.

Note.—This is the first insect of the kind I have seen at this place, and differs very much from the one I captured at Nusseerabad, which, I included in the collection given to Dr. J.'s lady, since taken to Edinburgh.

No. 2, *Fig* 2.—*Mhow, July* 27, 1839.—Genus Paussus, length 6-20th of an inch, body brown, rather deeper in color near the sutural margin of the elytra. Antumæ of two joints, the last having an elongated pedicle resembling an intermediate joint, the club is pear-shaped when viewed from above, irregular if seen in flank, edges compressed, forming a carina which is produced into a small tooth near the basal angle. Head has the front slightly emarginated in front and rounded, narrower than the thorax from which it is exserted, eye rather large for the insect, rounded when seen from above, reniform when viewed on the side. Thorax cordiform, broadly truncated posteriorly, having a transverse sinus crossing its centre. Elytra narrowed anteriorly, rounded on the posterior external margin, squared on the internal one, abdomen tumid and very like many of the Carabici I have been lately taking. Tarsi of five joints, the first of the posterior tarsus scarcely discernible, unless the foot is put in motion; last joint longest, all of them cylindrical or ob-conical, and furnished with a few hairs beneath.

Note.—This insect came into the lights on the table sometime after gunfire last night.

No. 3, *Fig* 3.—*Sultanpore, Benares, June* 21, 1840.—Genus Paussus, length 10-20th of an inch. Antennæ of two joints, the last of which is massive, spindle-shaped when seen from above, irregular when viewed at the side, upper margin produced, and forming a recurved tooth at its basal angle, at the side of each club. Near the base is a slight impression somewhat in the form of a cocked hat, three rather deep sulci cross the club near the centre, extending half way down each side. The head, thorax and antennæ, are a light reddish brown. The under-part of the body, together with the abdomen and legs, are of a dark brown, tarsi almost black. The elytra are black with a margin of sienna brown, or light chesnut, and are densely covered with silvery hairs, apparent when viewed through the microscope. Near the posterior external margin of each elytron, is a curious appendage I have not previously observed in these insects. The abdomen has its latter segments very broad, and appears distended. The thorax is cordiform, broadly truncated posteriorly, with the posterior external angles slightly produced and rounded, a deep sinus in the form of a bracket appears to divide the thorax into two nearly equal portions. The head is almost triangular, with a rather deep excavation on the frontal margin; the posterior part of the head presents a strong emargination rising in an arch between the eyes, which last are large, prominent, rounded from above, reniform if seen at the side. Palpi elongated, conical, those of the maxillaries overarching the labial, approximated near their tips, and apparently of four joints, of which the first is by far the thickest, the last cuneiform. This Paussus with its congeners is surely misplaced, and erroneously classed with the Tetrameræ, for the joints in all the tarsi are visibly five, and may be readily distinguished with the naked eye.

Note.—It struck me that of the three I captured last night, one crepitated, or made an explosion similar to that produced by the Brachini, and most certainly while I now write my finger and thumb bear marks, as of caustic or something like it, though I assuredly have not used any thing of the kind for many months past. We have had very heavy rain for the last eight days; yesterday was the first fine day we have had since the rain set in, which may account for my great good fortune in capturing so many as three of these highly curious insects, all of which by the bye came in late, for it was near one A. M. before I got to bed.

Note Book.—Sultanpore, Benares, June 22, 1840.—Captured another Paussus similar to the three taken on the 21st instant, but it unfortunately fell into the oil of the lamp, and was killed before I could try its crepitating powers, which I more regret, as it is quite uncertain when I may again procure a specimen. I have already noticed that we have had very heavy rain for several days past, and insects both last night and on that of the 21st were more numerous than I ever remember to have seen before. A lamp I placed outside for the purpose of attracting them to its light, was after a minute or so, extinguished by the immense numbers which flitted about it, and to save the wanton destruction of life, I was compelled to cover the lamp with a wire shade at the expense of much light. As for myself, I could scarcely remain near the spot, though covered from head to foot with a black blanket; even with this precaution, my hair and clothes were so covered by the myriads which swarmed around the light, and caused me so much annoyance by getting under my dress, that I was forced to make a virtue of necessity, and strip myself to a pair of light trowsers and white night cap, but for which I considered myself amply repaid in the capture of many new, and to me rare, specimens. Among the most common were several varieties of Carabus, four entirely new to me, Hegeter, Tenebrio, Agieliæ, and swarms of minute Capridæ. Of the rarer sorts I took two new Cicindelæ, two Colymbetes and very beautiful Haliplus, which I had never before seen. All these came around the light in numbers, but Staphylini and the smaller Orthopterous insects were incredibly numerous. I was almost black with them, and the sensation produced over my back, arms and legs, from the multitude of grasshoppers and crickets which were constantly jumping on or off me, and crawling in every direction, was very similar to what is called "needles and pins," or a "foot asleep." Great indeed was the enjoyment of a bathe with some dozens of ghurrahs filled with cold water, which I poured over my head before retiring to rest at one A. M. I should also mention, that on visiting the Commandant of my Regiment this morning, I found that he also had captured a Paussus last night, similar to those I have been lately taking, between the hours of nine and ten P. M., and rather strangely to say, his specimen had shared the same fate as my last, having fallen into the oil-burner on the table.

No. 4, *Fig.* 4.—*Sultanpore, Benares, July* 24, 1841.—This Paussus has already been figured in the 2d vol. of the Transactions of the Entomological Society, by W. W. Saunders, Esq., but as his drawing though highly characteristic, must (I conclude) have been taken from a dead specimen, perhaps a dried one, I have thought it worth while, if only for my own satisfaction, to make another delineation of it from a living specimen which I this morning captured, having succeeded in rescuing it without damage from the gripe of a small black ant, which in spite of its struggles was bearing it along with the utmost facility, holding on by one of its antennæ. Length seven-twentieths of an inch. The head is rounded posteriorly and sunk into the thorax. A deep cavity with edges in the form of a horse-shoe, the anterior margins of which are levelled towards the front, is a prominent feature in this organ. The bevelments terminate at the front just above the forehead, at which spot they turn upwards a little, and appear to spread out in the form of a rather deeply emarginated clypeus. In the centre of this excavation are two minute vesicles, resembling the eyes on the anterior extremity of the scorpion, of a resinous color and lustre. The antennæ are composed of two joints, the last very large, somewhat irregular, approaching in form to navicular. The edges of the upper margin present the appearance of a screw, both edges meet posteriorly, and form a slightly recurved spine projecting from the basal internal angle. The club when viewed at the side, resembles a butcher's cleaver. The thorax has it's upper portion cardiform, and appears as if fitted into a cavity of the lower part, which latter also presents a crenulated edging extending the whole breadth of its centre. The margins of the thorax, head, and particularly the screw-formed edging of the antennæ, appear translucent, and in color very much resemble shell lac. The eye is kidney-shaped, but appears round when viewed from above. The palpi are short, and not very salient. The abdomen is turned and gibbous near the cloaca, and its extremity is furnished with two large bundles or brushes of densely set golden colored hairs, having also a vitreous appearance, and which are only rendered distinguishable by being disturbed with the point of a pin or such like implement; these hairs I found so very closely arranged, that even with my greatest care in trying to separate them, I never once succeeded in singling out a fibre: they always remained in bundles, or in the form of a moistened painting brush. I must not omit to state, that the character of this curious appendage was (I believe) first made known to the world by W. W. Saunders, Esq.; at all events my observations on it were induced from what I read in his account of this Paussus, published in the 2nd vol. of Entomological Transactions.

The elytra which are black, with their anterior and posterior margins of a pinkish brown, have their surface closely covered with silvery hairs, and near their posterior external margins the curious folicle I have already observed in No. 3, is very apparent. The abdomen is of a dirty yellow or Isabella color, approaching to light umber, and near the penultimate segment beneath, there are a pair of spines which curve slightly outwards, for what intent and purpose I cannot conjecture. Breadth of elytra and abdomen equal throughout. Tarsi evidently of five joints, the last longest.

Note.—I tried all I could to induce this specimen to crepitate, without success. Probably its battery had been expended in its struggles with the ant, from which I captured it. On being touched, it would immediately similate death, and remain with contracted legs for many minutes at the bottom of the tumbler in which it was placed. The second day becoming more and more lethargic, and fearing its death might ensue, I plunged it into hot-water, at which moment the abdomen became very much distended and glabrous; but this was the nearest sign I could perceive of any approximation to the Brachini.

No. 5, Fig 5.—Sultanpore, Benares, August 17, 1841.—I this day captured the Paussus delineated as No. 5, which I however consider to be of the same species as No. 4, but differing in sex. On being captured, it immediately emitted two loud and very distinct crepitations accompanied with a sensation of heat, and attended by a strong acidulous scent. It left a dark-colored stain on the fingers resembling that produced by caustic, and which had a strong odour, something like nitric acid. A circumstance so remarkable induced me to determine its truth, for which purpose I kept it alive till the next morning, and in order to certify myself of the fact, the following experiments were resorted to. Having prepared some test paper by coloring it with a few petals of a deep red oleander, I gently turned the Paussus over it, and immediately placed my finger on the insect, at which time I distinctly heard a crepitation, which was repeated in a few seconds on the pressure being renewed, and each discharge was accompanied by a vapor, like steam, which was emitted to the distance of half an inch, and attended by a very strong and penetrating odour of nitric acid, in every respect (as far as I could judge) similar to that produced by many species of Brachini, I have frequently had opportunities of trying. On removing the Paussus from the paper, I found that a large spot was formed, near the place where the abdomen had been, and extending backwards for one-third of an inch. The paper appeared strongly corroded as if with caustic, the color of the spot being light brown, and totally distinct from the purple of the surrounding surface. Having repeated this experiment four times during the day with the same results, and being perfectly satisfied that I could not be mistaken, I proceeded to kill and set the specimen. On being thrown into boiling water, the abdomen swelled up and appeared like an inflated bladder, being very much distended, assuming the same appearance as that which is observable in Brachinus and other allied genera, when they are similarly treated, and which I have had hundreds of opportunities of verifying. From these facts I presume, that there is a greater connexion betwen Paussus Carabus than is generally believed, and perhaps they might be removed with advantage to the vicinity of each other. It was only when I commenced setting my specimen for the cabinet, that I observed that it differed slightly from my No. 4. I may therefore give the description.

The principal points in which it differs are: first, in the thorax, the cremelations which cross its centre being more deeply sculptured and foliated; secondly, the antennæ instead of leaving their upper margins in the form of a screw, are dentated, having four rather large scallops on each side, one between each tooth; and lastly, the abdomen, though provided at its posterior extremity with the brushes noticed in No. 4, wants the spines beneath the abdomen, which latter organ instead of being of one breadth throughout, is narrowed as it approaches the thorax. In length it is the same, being 7-20th of an inch long, including the antennæ when placed at an angle with the body, and of the latter organs the last joint is the largest, of an irregular form, or nearly boat-shaped, with dentated margins above, which terminate at the posterior and superior angle in a tooth. The excavation on the head is very deep, at the bottom of which, the two vesicles similar to those noticed in No. 4 are very apparent, and highly resinous in lustre. The palpi are somewhat more salient, but at the same time more attenuate than in that insect. In its markings, there is also a strong resemblance, but the abdomen is slightly darker, and the pinkish brown patches at the posterior and anterior margins of the elytra are broader and better defined. I should notice, that in each experiment on the detonating power of this insect, I have used a different finger in giving the small degree of pressure required to induce its crepitating; all of which have been well marked, but those of the last two trials are not quite so dark as the stain left on the three first, and I am anxious to see how long they will remain on my hands. Although I have for some time past suspected the fact, that the Paussus had the curious property observable in some of the Carabici, and which (I imagine) is believed to be inclusively attached to them, it was not till the capture of the present specimen that I determined to try the truth of my surmises. The present insect having been taken by a lady in company, who from the sensation she felt beneath the finger, concluded she had mistaken a small Brachinus for a Paussus, and the skin of which, bore evident marks of the displosion, I have been induced to make these experiments, and the results have been as above stated. Captured No. 5 at a quarter after nine P. M.

Note.—*August* 29, 1841.—All the marks off my right hand.

Note.—*September* 3, 1841.—I have now lost all the stains on the fingers of my left hand, which I received in the experiments performed on Paussus, No. 5, by which it appears, that those of the left hand have remained 18 days, or 6 days longer than those on the right. This is singular enough, and I can only attribute the loss of the marks so much earlier in the right hand fingers to attrition, and more constant use, as the stains left were certainly much deeper in the three first trials than in the latter ones, and where I used the first, second, and third fingers of my right hand respectively.

No. 6, *Fig.* 6.—*Sultanpore, Benares, September* 5, 1841.—This Paussus has the thorax somewhat similar to that part of No 1 which I captured at Mhow, but in other respects differs considerably. Length 6·20th of an inch. The antumæ are composed of two joints, of which the last is very large, and in the form of a wide-mouthed cornucopia, being attached to the first at its basal angle. The margins of the upper side are slightly crenulated, and the upper surface is rather deeply excavated, giving this part a cuspiform appearance. Anterior and posterior margins compressed, the latter produced into a blunt recurved tooth. The sides of the club are faintly striped with 6 grooved bands; the eye when seen from above appears round, of an irregular oval shape when viewed from the side. Head trigonal, depressed with a marginal excavation, but no groove on the upper part. The thorax appears as if composed of two portions, the anterior being angulated, and forming a rather sharp spine on each side, with its base inserted in the posterior part. This latter portion is crenulated, with the exterior margins produced and rounded; a sulcus in the form of a bracket crosses the centre. The elytra are black, broadly patched anteriorly with brownish sienna, the posterior margin has a faint undefined line of the same color, which blends into the general black of the wing cases. The folicles at the exterior margin of the elytra posteriorly are much produced, and close to them on each side is a very curious moveable spine, slightly incurved, and projecting over the latter segment of the abdomen. Body beneath a bright chestnut; head, antennæ and thorax a livid brown; all the joints in the tarsi are simple, cylindrical, furnished with hairs beneath, and of five joints in each leg, the first small, the last longest.

Note.—Taken accidently while sweeping in high grass with a net under a Munja clump, (Saccharinum Munja.) On withdrawing this insect from the net, it gave two very distinct explosions, leaving the ordinary black stain on my fingers, the abdomen also swelled very much when submitted to the hot-water process.

No. 7.—*Sultanpore, Benares, September* 6, 1841.—A very curious Paussus, length 6-20th of an inch. Antennæ of two joints, the last long, club-shaped and grooved all round, forming six divisions, which, however, I could not discover to be perfoliate. The first joint near the base beneath is furnished with a small curved spine, above which, near the club, is a minute oval excavation. Head hexagonal, irregular, somewhat gibbose; eyes not visible from above, rounded when seen at the side. Thorax cordiform, broadly truncated posteriorly, with two small depressions on each side. Abdomen cylindrical, or shaped like a tub, palpi small, salient, the labial ones being over-arched by those of the maxillaries. No follicle observable on elytra. Tarsi of five joints, all simple, the first exceedingly minute. The coloring in this insect is peculiar; the last three divisions of the antennæ, and lower half of the elytra, are blue black. The head, antennæ, thorax, abdomen, and upper portion of the elytra, a bright light sienna. The legs and tarsi chestnut.

Note.—Found crawling up the wall of my bathing room. On being plunged into hot-water, the abdomen became greatly distended; but I observed no crepitation at this moment, or at the time of capture.

No. 8, *Fig.* 8.—*Almorah, July* 29, 1842.—Genus Paussus, length 9-20th of an inch. Head gibbous, strongly excavated both anteriorly and posteriorly, exserted from the thorax, the neck appearing very long. Antennæ of two joints, the last long, shaped like a peas-cod and bearing a small recurved tooth near 'the base of the upper' margin, edges compressed, and forming a carina on each side. Thorax cordiform, broadly truncated posteriorly, with the lateral margins produced: a sulcus in the form of a crescent runs across the thorax near its centre. Elytra slightly narrowed anteriorly, and when viewed through the microscope appearing smooth, with diminutive frettings running in irregular lines down each; these are blue black, with a line of brown extending along the sutural margin, and a shading of the same color obtains both anteriorly and posteriorly. Head, thorax, and body chestnut brown; tarsi of five joints, the first small. Palpi rather large, salient, those of the maxillaries in particular. Eyes almost oval, but still uniform. Follicle on the elytra very apparent.

Note.—On capturing this insect which came in towards the light on the table some time after gun-fire, last night, I distinctly heard two strong crepitations, and my fingers were deeply stained with a brownish black color, and I accordingly reserved it for further trials, but unfortunately it appeared so weak this morning, that I was after ineffectual attempts to induce crepitation, obliged to postpone my experiments to a future date. On being killed with hot-water, the abdomen however shewed the usual sign, becoming greatly inflated.

Almorah, July 30, 1842.—I have indeed been fortunate in capturing the same species of Paussus as that of the 29th instant, and which was taken under precisely similar circumstances, having come to the lights at about 10 P. M. The crepitation on its capture was loud and very distinct, so much so, as to be heard by the company at table, and certainly equal to that of most of the small Brachini. I therefore tested its powers this morning again, having prepared some post paper with the petals of a deep colored Dalilia. I went through the old trial. The insect being carefully turned over it, I attempted its seizure, and as expected, a loud explosion was given, accompanied with vapor, and a strong scent of nitric acid. (I have the pleasure to transmit the paper on which the experiments were tried which bears two distinct marks, having only tested this insect twice.)*

I now proceeded to examine the foliaceous appendage on the elytra through the microscope, and I found that when the part was touched, an emission immediately took place from the spot, which spread so instantaneously over that part, that I could not observe exactly whence it originated. The appearance of the liquid resembled pus, which in a second or two granulated (if I may so term it) into egg-shaped grains, of which no traces remained after a lapse of a minute.

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* We have not received this.—EDS.

I tried each elytron twice with precisely the same results; during each emission a faint acidulous odour prevailed, and the part being touched with my finger, imparted that scent in rather a stronger degree to it. Having taken a drawing of the insect, I directed my servant to remove the microscope to another table, and in so doing, he unfortunately dropped the specimen, and has thus brought my experiment to a close.

Should the foregoing observations be considered worthy of publication, I shall be happy to transmit further extracts from my Note Book as occasion may present, or apply myself to any other point of utility in which my services may be deemed acceptable.

I also take this opportunity of enclosing the copy of a very magnificent species of Scarabeus, which I was so fortunate as to capture a few days since. The form appears familiar to me, and I fear may not be new to science; but having no means of referring to books on the subject myself, perhaps you can supply the required information; at all events, as it strikes me to resemble the general form assumed by the equatorial Scarabæi, it will be interesting to know that this insect was captured at an elevation of near 9,000 feet above the level of the sea, having been taken on the summit of the Gogur range in Kumaon, and was found feeding on the leaves of a tree unknown to me, but which I believe to be a species of Maple. Length three inches, weight one ounce, head and thorax a jet glossy black, the former furnished with a large recurved horn in the form of a sickle, compressed at the base. The thorax presents four protuberances, two above and two on the anterior margins. Scutellum black, elytra light chesnut brown, abdomen and legs deep chocolate. The maxillaries curiously dentated at their apices, and furnished with hairs. Maxillary palpi of four joints, the last spindle-shaped and longest, the first conical and smaller than the second. Mandibles, which are corneous and squared, jut out considerably beyond the sides of the head; they are also thickly set with hairs, both on the internal and external sides, labial palpi very small. Antennæ of ten joints, the first conical, the next three nearly round; the club is composed of three leaflet joints, and the intervening ones are nearly cuspiform, the tarsi are simple, of five joints, the last much produced. Hooks nearly equal in length, and furnished beneath with a stiff seta, which near its apex is split into a brush-like form. Taken August 17, 1842, above Budlakhote, Kumaon. The drawing is taken of the natural size.

Fig: 1

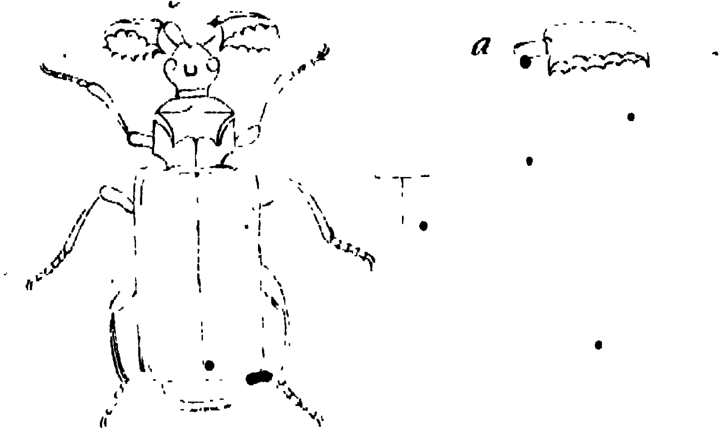


Fig 2

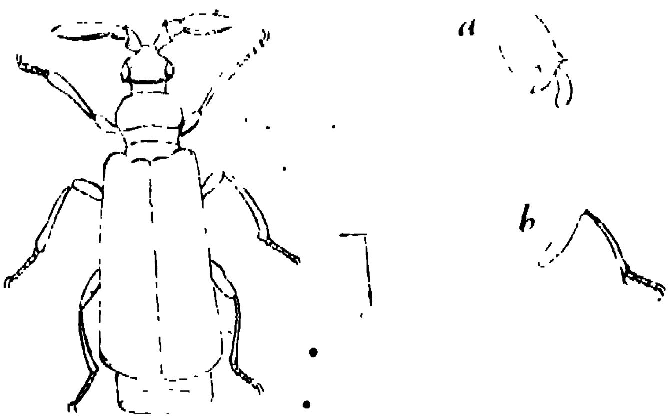


Fig 3

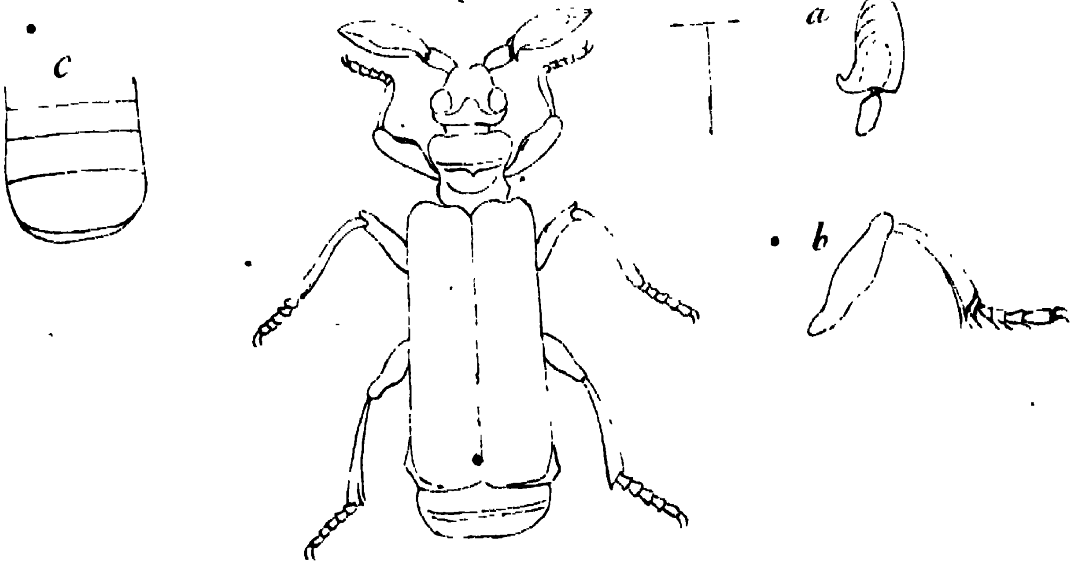


Fig 4

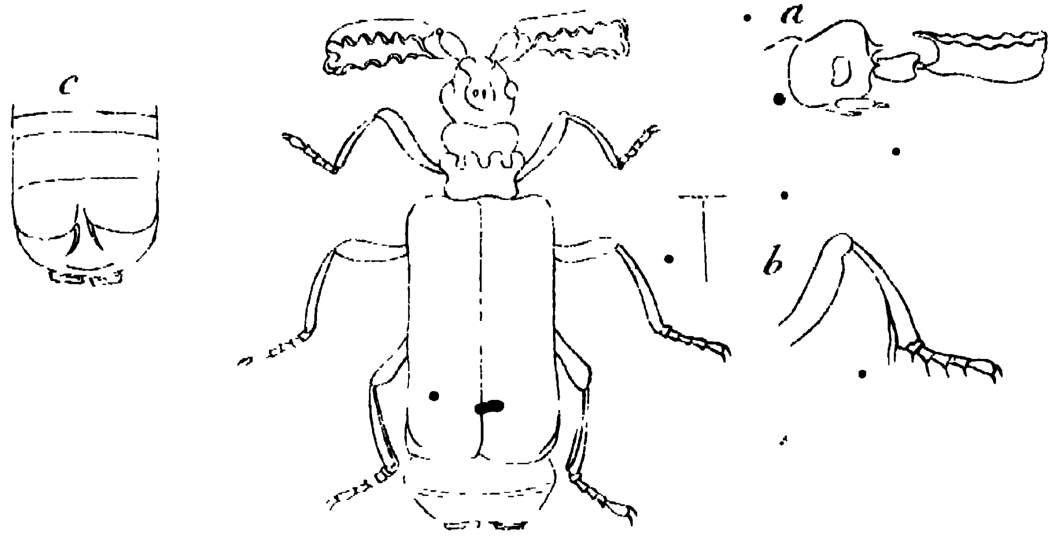


Fig 5

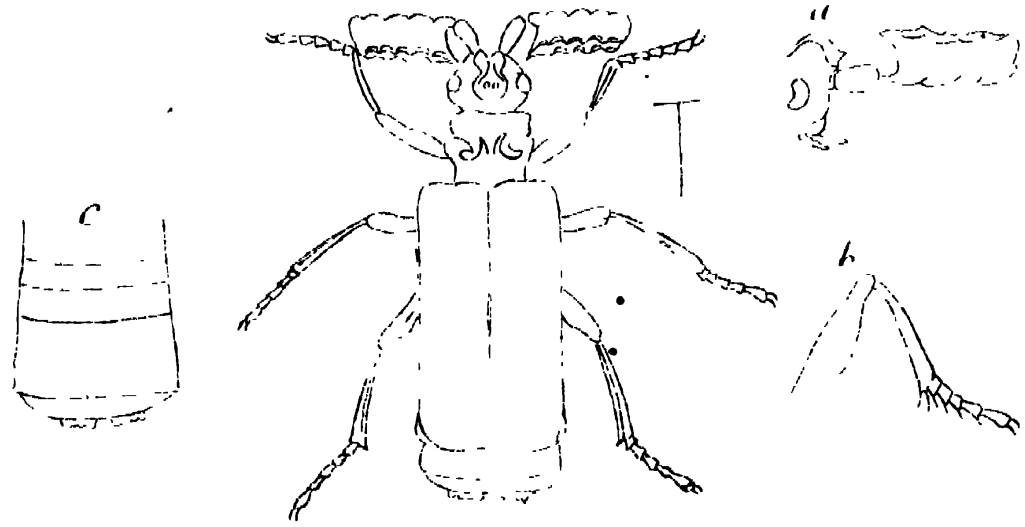


Fig 6

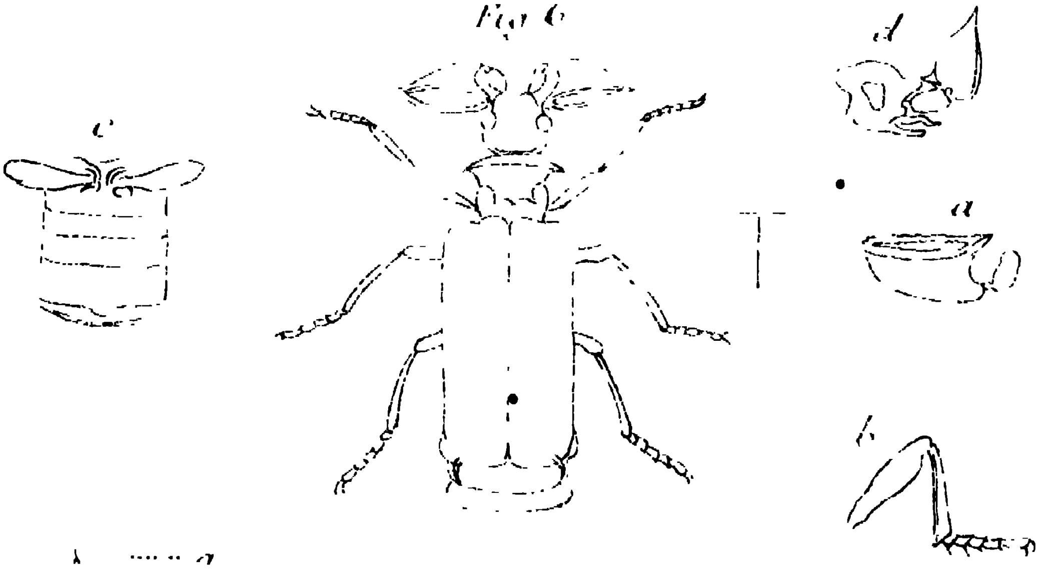
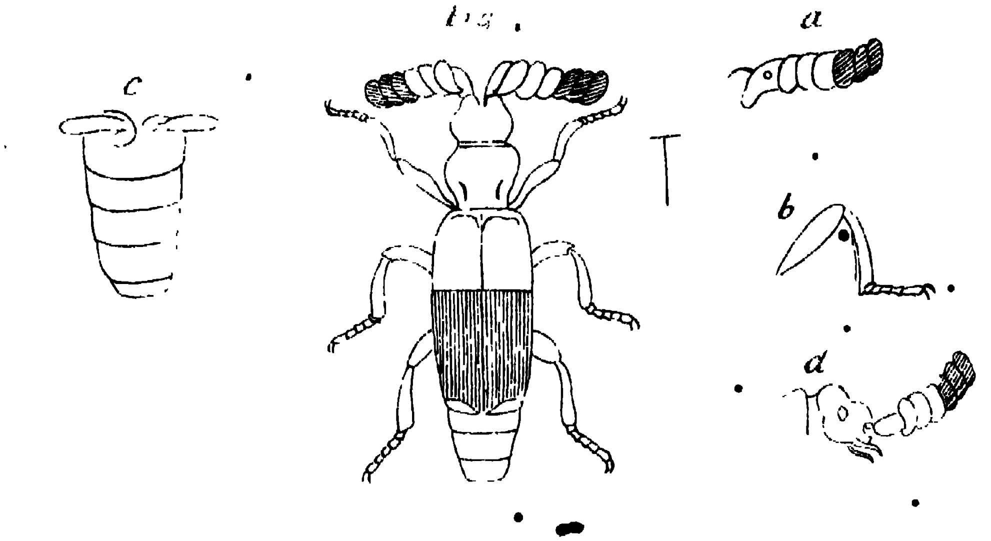


Fig. 2.



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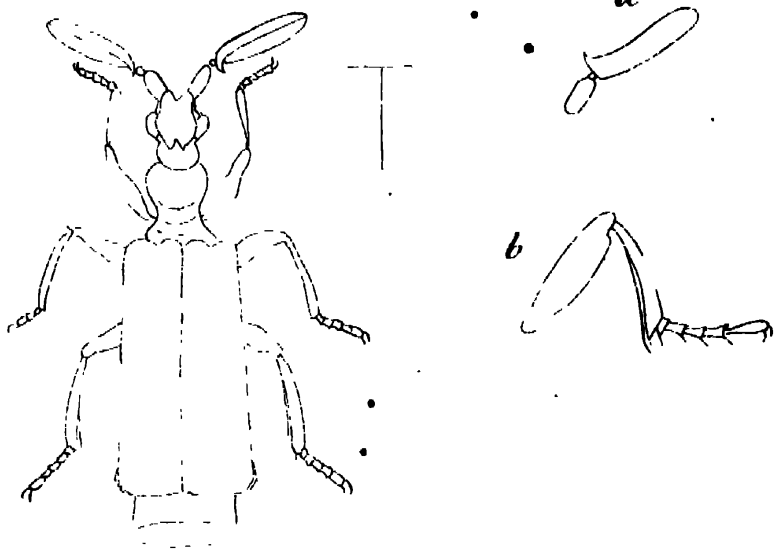

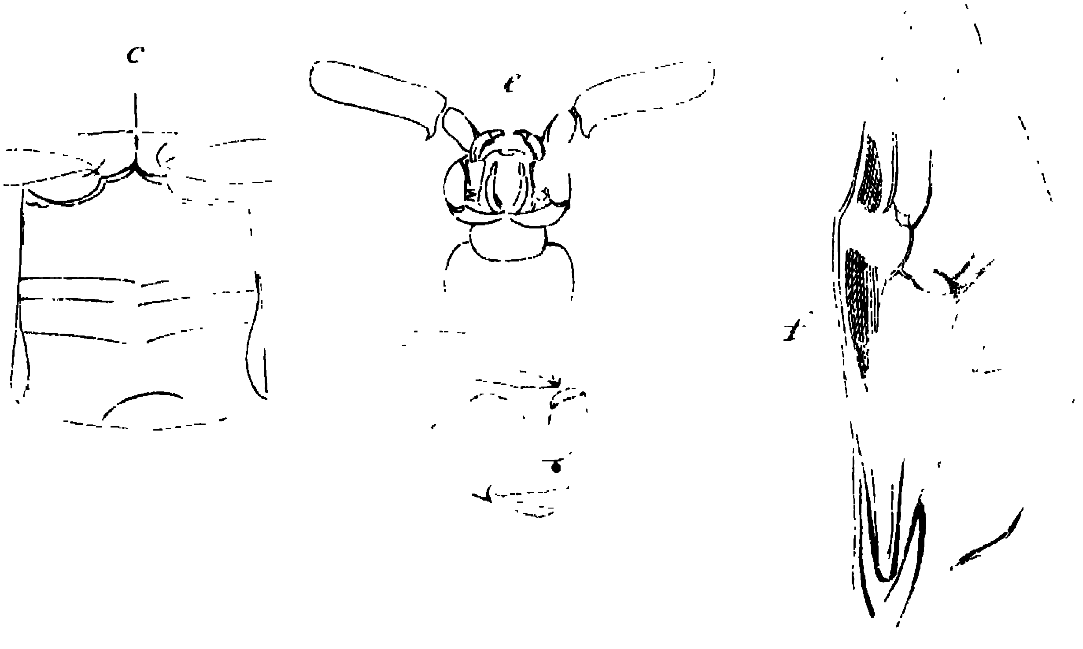

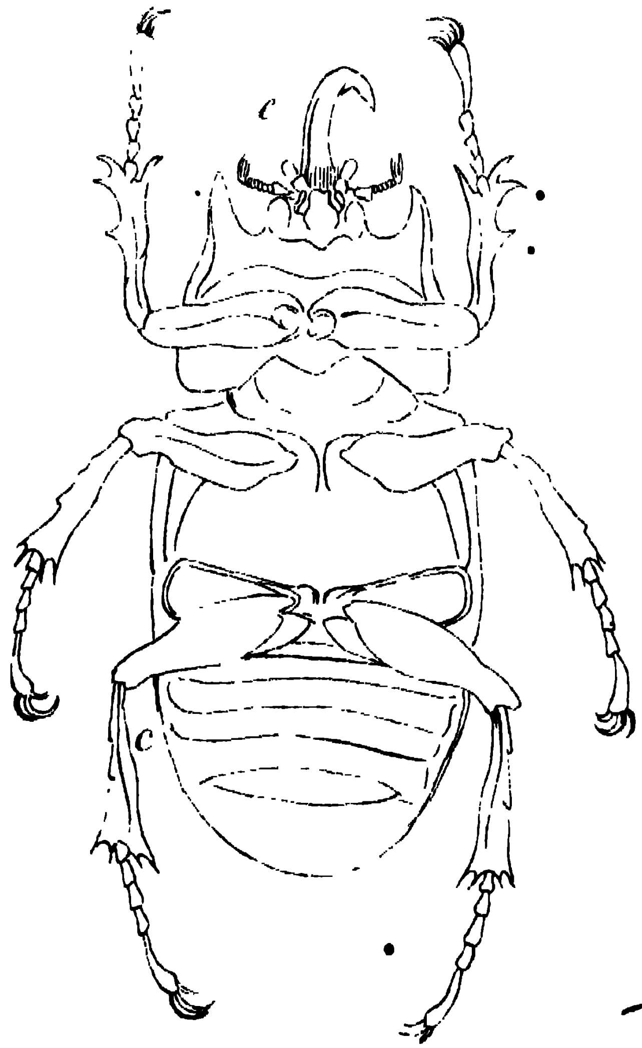
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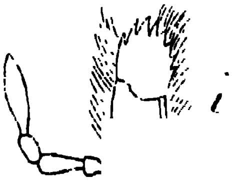
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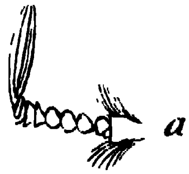
a

b

The accompanying letters refer to the sketches of the Paussi equally with the Scarabeus: *a,* antennæ; *b,* posterior tarsus; *c,* abdomen; *d,* side view of head; *e,* inferior view of head; *f,* underwing; *g,* spine of elytra; *h,* folicle or elytra; *i,* maxillary palpus and maxillar.

Almorah, September 16, 1842.

Memorandum on the construction of a Portable Meridian. By E. C. RAVENSHAW, *Esq., B. C. S.*

1st. Those who have visited the Cathedral of Florence, or the Church of Saint Petronio at Bologna, may recollect having observed a straight line running down the whole length of the aisle, and a small round hole in the wall of the building, about fifty or sixty feet above the level of the pavement. A traveller who should enter either of the said churches about noon, would not fail to be struck by the mysterious conduct of those about him; a dozen watches of quaint forms and various sizes would be seen to spring suddenly from the fobs and waistcoat pockets of people as quaint and peculiar as their timepieces. Their eyes would be seen to be intently fixed on some object on the ground, and the traveller would naturally imagine that the toe-nail of a saint or a martyr was about to perform a miracle, the exact period of which it was as important to fix as that of the transit of Venus. On joining this interesting group, the traveller would find that the object of solicitude was a bright round spot caused by a ray of the sun passing through the aperture above mentioned, which is seen slowly approaching the line that runs down the centre of the aisle. This line is a meridian, and when the bright round spot arrives at, and is bisected by this line, the sun intimates to the spectators, that he has reached his meridian altitude. The watches are returned to their fobs, and voices are heard muttering in Italian, German, French, and English, either self-congratulations on the accuracy of their Breguets, or uncomplimentary remarks upon the artists who manufactured their watches.

2d. Imitations of these magnificent meridians are made on a small scale by individuals for private use; a wooden rod or pedestal, about a foot high, having an iron plate with a hole in the centre, fixed at right angles on the top of the pedestal, forms the substitute for the wall of the Cathedral; one of this description is (or was two years ago) to be seen at a window in the house of the Catholic priest adjoining the Church at Bettiah in the Chumparun district. A French gentleman, (now Principal of the Dehli College,) acquainted me with the method of laying down the meridian line from the above instrument, and I have since then constructed several. All these meridians are of course fixtures, but it occurred to me, that if a portable one could be made, it would be extremely useful when travelling about the country in tents, and an excellent substitute for one of Dolland's Universal Dials. Though inferior to the latter in the circumstance of shewing only one hour in the day; viz. twelve o'clock, yet it would be superior in shewing that hour with an accuracy unattainable by the Universal Dial, owing to the variation of the compass by which the latter is always set. The variation of almost every needle differs considerably, so that a knowledge of the general or average variation of the compass at a particular place, does not afford any information as to the variation of the particular needle in your dial, and without ascertaining this point, no dependence can be placed on the time given by the dial. A variation of one degree makes a difference in time of about five minutes, and the annexed memorandum, made by Lieut. Thuillier, (the Revenue Surveyor of Cuttack in 1841,) shews, that among a number of needles, all of the same length, some differ from others to the extent of 4°; supposing the latter to be the variation of the needle in an Universal Dial, there would be an error in the time of about 20 minutes.

THEODOLITES.

Instrument.					
No.	4.	2°	38′	0″	Variation East,
,,	16.	2	21	0	January 1811
,,	12.	3	39	0	at Cuttack.
,,	21.	2	37	0	
,,	23.	2	49	0	These needles
,,	61.	2	33	18	not more than
,,	79.	2	17	32	3 inches long.
,,	76.	1	36	22	
,,	5.	1	26	0	

3d. The Portable Meridian which I am about to describe, if accurately constructed by professional instrument-makers, such as Dolland, or Troughton and Simms, would give the time with much greater, if not perfect, accuracy, as it would be free from all errors arising from the variation of the compass. This instrument, shewing (or professing to shew) the true meridian, would also

PRISMATIC COMPASSES.

Instrument.					
No.	2.	1°	15′	0″	Variation East,
,,	3.	1	0	0	needles 2½
,,	4.	4	0	0	inches long.
,,	9.	2	15	0	
,,	34.	3	30	0	
,,	46.	1	45	0	
,,	36.	2	39	0	
,,	16.	3	30	0	
,,	119.	2	15	0	
,,	23.	1	15	0	
,,	22.	1	15	0	
,,	40.	3	45	0	
Compass	3.	2	0	0	
,,	12.	2	0	0	
	21.	1	38	15	
	17.	1	45	0	

enable any person, however unscientific, to determine the variation of any needle in a minute by mere inspection. The altitude of the sun or moon,[*] when on the meridian, can be read off with equal ease, and the latitude of any place ascertained with the aid of a Table of Declination pasted on the lid of the box. By fixing sights at each end of the meridian line, the instrumeut would serve for taking levels; and last, though not least, would enable Surveyors to lay down a long meridian line for the base of all their triangles, with much less difficulty than is experienced in many of the usual methods. Though simple and easy in theory, many of these methods are difficult in practice. They require that an officer, perhaps suddenly ordered out to make the survey of a district, should be in the possession of certain instruments and certain astronomical works, which are not always to be obtained. For instance, the most approved method of laying down a meridian is said to be by observations of equal altitudes of the Polestar; but without the Nautical Almanac for the year, which is not always to be obtained, it often requires nights of watching, and the patience of a Chaldean to catch the star in the small field of a Theodolite telescope at the precise moment necessary for the accuracy of the observation. The process by observation of the sun's azimuth is also I understand not free from difficulties. Under these circumstances it is hoped, that the simple instrument now submitted for consideration, (though it does not pretend to perfect accuracy,) may be occasionally found useful by the scientific as well as by the unscientific world. With these few explanatory remarks, I proceed to describe the instrument, a sketch of which accompanies this memorandum.

4th. A B C is a brass semicircular plate, about 2-10ths of an inch thick, with the degrees marked on the rim, which are counted from the point C. both to the right and left, D C being of course at right angles to A B. E F is a moveable radius turning on the point E, and having degrees of altitude marked on it, as shewn in M N. The mode of laying down the degrees by means of a graduated circle will be understood from the figure S T V; K L is a perpendicular flat rod having a small oblong plate L with a hole in the centre, fixed at right angles to K and parallel with the horizon. This rod KL is to be fixed at D[†] perpendicular to the brass semicircle A B C., so that the round hole L shall be immediately over the centre point E. I I I are elevating screws by means of which the instrument is first to be accurately levelled. This may be done either by placing a common spirit level on the brass plate, or by having two small spirit levels at right angles to each other let into the plate.

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[*] At night.

[†] As exemplified in the figure O P.

5th. *To find the meridian line,* place the instrument or rather the line E C due north and south by any compass, C being the north point and E the south, at any time (say an hour) before noon[*] the sun will be observed to shine through the hole L, throwing a bright round spot on the left side of the plate near one of the circles a,[†] a, a; wait till the spot comes on the circle, say at G, and mark the point with a pencil. Then move the right side of the radius E F up to it, and read off the number of degrees, say 50° on the rim of the plate. The sun after crossing the circle at G will proceed along the dotted line until it reaches the other side of the circle at H, where it will arrive about an hour after noon; mark the point as before and read off the number of degrees, say 30°, add them to the number noted above (50°), the result will be 80°. Divide by 2, which gives 40°, or the bisection of the arch G H, move the radius to the point of the rim marked 10°, which is half way (or 40°[‡]) between the extreme points G and H. The direction of the radius as now placed will be that of the true meridian, being the bisection of the arch G H, described by the sun himself, (the great *Archimedes*) at equal altitudes.[§] The instrument having been originally set to the magnetic meridian, the distance between the line E C and the radius E F; viz. 10°, is the variation east of the compass with which the instrument was set. It is evident that the variation of any other compass may be ascertained in the same manner, or by placing the needle with its own graduated circle on the meridian line E F.[||]

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[*] Two hours would be better if the sun is very high.

[†] Any number of circles may be drawn, six or eight are necessary to suit different times of the year.

[‡] Either the line M N, or the right side of the radius will answer if placed opposite 10°, but the former is best.

[§] The difference in the sun's declination in two or even four hours is so slight, that it would not cause an error in the position of the meridian of more than a few seconds, it is unnecessary therefore to apply the equation of equal altitudes.

[||] Where great accuracy is required, and the needles are long, the observation should be made either at 10 A. M. or 10 P. M. as the needle moves slowly west in the forenoon, returns to its mean position about 10 P. M. then deviates to the east, and returns at 10 A. M. like the barometer.

6th. *To find apparent Noon,* the instrument must remain in the same position until next day, and when the luminous round spot occasioned by the sun shining through the aperture L falls on the centre line M N of the radius, the sun is at its meridian, and shews apparent noon. By adding or subtracting the equation of time for the day of the month, the mean time, which a watch or clock ought to keep, will be ascertained.

7th. *To find the altitude* it is only necessary to mark the point on the radius where the sun crosses it, and read off the altitude.*

8th. *To find the latitude,* deduct the observed angle from 90°, and add the result to the declination if north. If the declination be south, add it to 90°, and deduct the observed angle. At the equinox, the observed angle deducted from 90° gives the latitude.

9th. *In order to lay down a meridian line* for survey purposes, fix the sight R on to the rim of the instrument opposite the rod o, as shewn in the figure O P. Look through the two corresponding apertures (which are exactly on a level with each other) at a pole erected at some distance in the line of sight. Then move round and look through the sight P in the opposite direction at another pole erected to the south in the line of sight, cut a line on the ground connecting the two poles, and your meridian is complete.

10th. I have constructed a small instrument of this description, the diameter of which A B is 9½ inches, and the height of the pedestal or gnomon 2 inches. It is made entirely of brass, and the degrees on the rim have been marked off with great accuracy by a native mistry. The cost of the materials is not more than two rupees. The labour, however, is considerable, and the man asked sixteen rupees for the whole, including his own remuneration. This, however, is cheap compared with one of Dolland's Universal Dials, 4½ inches in diameter, which in Calcutta costs eighty rupees.

11th. Lest a scientific instrument contrived by an unprofessional individual, should be received with doubt or hesitation, I have annexed to this memorandum extracts from two notes from the professional Surveyor of Patna, giving his opinion on the accuracy and utility of the instrument, which I hope will be thought satisfactory. The principle of it was also approved by Lieutenant Thuillier, the Revenue Surveyor of Sylhet, who was in temporary charge of the Patna Survey, during the absence of Lieutenant Maxwell.

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* If the moon should pass the meridian at night, its altitude and the time may be ascertained in the same manner.

Extract of a letter from Lieut. Maxwell, Revenue Surveyor.

I hope the following will be satisfactory to you, and will prove to the world, that the little instrument deserves the name you have given it. I send exactly what I did, and assure you that I have not attempted to force the observations into good ones, they are all *bona fide* ones.

On the 27th, the morning observation was 70 50
Evening, ... 63 00
7 50
3 55 Var. of needle.
" " 28th, the morning observation was 71 30
Evening, ... 63 30
8 00
4 00 Var. of needle.

I placed two poles on the line (radius when set to the 4°), and the following angular observation from my meridian line, (whose bearing is 352° 59′), gives a capital result.

The true bearing of line A B is 352° 59′.

$\angle$ A B C.=41° 34′ $\therefore$ bearing of line B C is 214° 33.

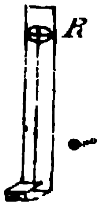
Interior $\angle$ B C D.=325° 22′ $\therefore$ bearing of line C D is 369° 55′.

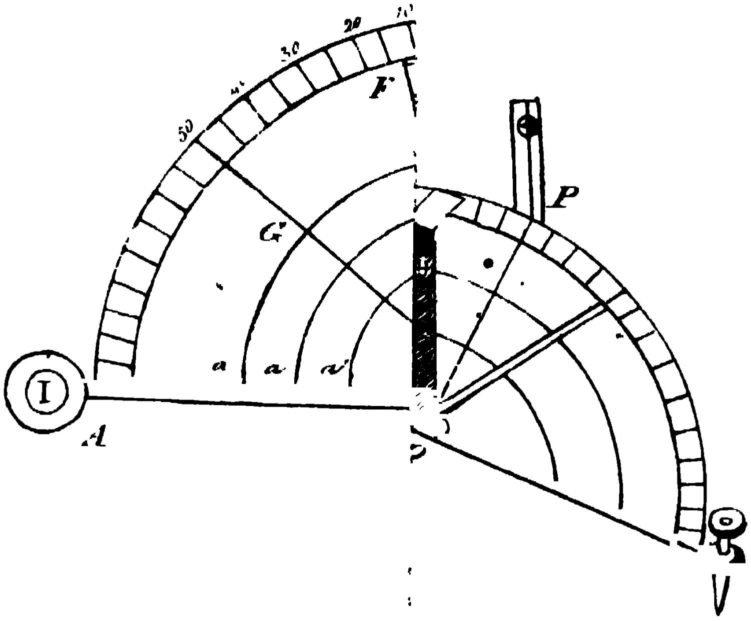
Line C D is set by your little instrument at 350° 00′ $\therefore$ the difference is 5′. Considering the difficulty of seeing through the sights, you will perhaps agree with me in thinking the result most satisfactory. There is no doubt whatever, that if an instrument like yours were made with a rack and pinion and divided to minutes, that the utmost accuracy would be obtained.

Extract from another letter from Lieut. Maxwell, Revenue Surveyor.

It is indeed an excellent "*hikmut*;"* its great beauty is its simplicity, for the most ignorant can use it, and I can with great confidence state,

* "Contrivance."





RAVEN

that two or three of them made by Captain Boileau, the instrument maker in Calcutta, would be a great acquisition in a survey where the European assistants in general know no more about checking a meridian line, or giving the latitude of their camps, than the man in the moon.

Descriptive list of some Coins lately received from the University of Christiana by the Asiatic Society. By Dr. E. Roer, *Librarian. Asiatic Society.*

To H. Torrens, Esq. *Secretary, Asiatic Society.*

Sir,—I beg to forward to you a descriptive list of the coins, which we have lately received from the liberality of the University of Christiana.

They consist of coins of some of the Danish kings of the Oldenburg dynasty, and of a most valuable collection of coins of the 12th century, especially Norwegian, forming a part of those coins which one Anders Anderson accidentally discovered under a large heap of stones on an uncultivated spot of his estate at Daelie in the province of Hedemarken in Denmark. Having delivered a part of them, of the weight of forty ounces, to the Magistrate, he afterwards sold to the University of Christiana 5000 coins of the weight of 13½ ounces, for the same weight of unmanufactured silver.

I take this opportunity of offering a few notices on the antient coins of Norway, for the materials of which I am indebted to the following dissertations of Mr. Holmböe, Professor at the University of Christiana:

1. De prisca re monetaria Norvegiae et de numis saeculi 12mi nuper repertis. Christianiae, 1841.
2. Descriptio ornamentorum, maximam partem aureorum, et numorum saeculi 8vi et 9ni. Christianiae, 1835.
3. De numis MD medii aevi, in Norvegia nuper repertis, 1837.

they I hope, will be of some interest for the numismatic members of the Society; and the more so, as according to a remark of Mr. Holmböe, the numismatics of Norway were for a long time not sufficiently explored. This arose from the rarity of antient Norwegian coins, as well as from the scanty notices given by the historiographers of the middle ages on numismatic subjects. The obscurity shrouding those remote ages had been partly dispelled in the course of the last fifty years by a great number of coins, dug out of the earth, or found in the foundations of some antient churches, which had been destroyed by various causes. Still the links were wanting to connect the coins of the 11th century with those of the 13th, which are now amply afforded by the coins found at Daelie.

The Norwegians used, as most nations did, the same term for money and cattle. The Norwegian word "Fe" signifies cattle and money, and "penningi" does not only denote the species of coins known under that name, but money in general.* In like manner, in accordance with other nations which fixed the value of things by metals, they weighed the metal before they had coins.† The antient weights of Norway are the following :—

1 Marca (mörk) = 8 Orae, (aurar)‡
1 Ora (eyrir) = 8 ″Ortugae, (ortugar.)
1 ″Ortuga = 10 Denarii, (penningar.)

The gold, used for weighing, was extended into a kind of wire in the shape of a ring, either simple or of many folds (called bagr or bauger,) which at a sale was weighed off entirely, or in pieces. The silver as a means of exchange was used in a similar manner, having sometimes the shape of a solid mass; sometimes of a ring; sometimes trinkets were also applied to the same purpose, till foreign coins are at last observed, especially Anglo-Saxon and German, of which a great many are found in Norway.

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* Clarke (on the connexion of the Roman, Saxon and English coins, p. 390) gives another derivation of this word which at first sight seems highly probable; that penning (evidently the same with the Norwegian word) was formed from the Latin pendo, and was sometimes written more agreeably to this origin "pending," and both expressions were derived from the antient and universal custom of paying by weight; but this appears rather an accidental coincidence, as the Saxon word is the same with the Norwegian and German, and in the latter language, the term p (f) enning obviously shews its origin from the word in use for cattle.

† The Hebrew word שׁקל originally denotes to weigh; thus talentum and libra signify a balance. The principal gold and silver coins among the Greeks were called staters, which is taken ἀπο της ςατικης from the scale. Thus in Rome, all payments were made per aes et libram.

‡ The terms marks and oras were first used by the Goths, and ora, which is corrupted from the Latin word "aureus" is synonymous with solidus.—Clarke, l. c. p. 310.

Copper was very rarely used as a means of exchange, and we may notice, that during this whole period no gold or copper coins were used in Norway, unless we should refer to the latter, the silver coins of the end of the 13th century, with which a large portion of copper was mixed. The price of the gold was about the 10th century eight times higher than that of silver, which proportion seems to have obtained throughout the whole of Europe during that period.

The greater part of the ornaments dug out of the earth are made of pure gold and silver, and it is even recorded in antient histories, (Sögur,) that the silver was cooked (brent silfr.) It may be here noticed as a curious fact, that many nations of no connexion whatever, and at most different periods, have adopted gold rings of the above described shape as the first equivalent of the price of things. Thus it is said of Gideon, that after his victory over the Ismaelites, he took from them a great number of gold rings, and Job received such rings from his friends. They are represented on the antient monuments of Egypt, are sometimes dug out of the earth in Ireland, Norway, Sweden and Denmark, and are still in use in Abyssinia and Guinea.

It is not quite certain which king of Norway first struck coins, though it appears probable, that it was not done previously to Hakim the Good,* (A. D. 938-963.) Of the coins of Hakim's successors, we know only one of Olav. Tryggveson (995-1000), one or two of Count Eric (1000-1016), one of Magnus the Good (1035-1047), and one of Harold Hardrade (1074-1067), while in antient chronicles we find no mention of Norwegian coins before Harold, of whom they state the particular circumstance, that eight days after the celebration of Christmas, he distributed some money to his soldiers, which according to the same authorities were called Harold slata, (struck by Harold), and for the greater part consisted of copper. The art of coining seems to have been earlier introduced into Norway, than into Sweden or Denmark; for the most antient coins of Sweden are those of Olaus Skotkonung (993-1024), and of Denmark those of Sveno Tueskjaeg (991-1019), on the coins of whom the name of the same mint-master is inscribed as the coins of Olav Tryggveson (995-1000); but in Norway coins were already struck under the reign of Hakim the Good or the Bad, which latter reigned between 978-995.

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* In the year 1834 a great variety of ornaments and of Byzantine, Arabic, Franco-Gallic and Anglo-Saxon coins of the 8th and 9th centuries were found in Norway, and from the fact, that no Scandinavian coins were among them, we may conclude, that at the period, when those things were used as ornaments, that is, in the 8th and 9th centuries, no Scandinavian coins were struck. It therefore becomes probable, that this was not done before the middle of the 10th century. The most antient Norwegian coins as yet discovered, are those of a Hakim; but as two kings of his name have reigned in that century, Hakim the Good and Hakim the Bad, who lived about the end of the 10th century, it is doubtful to whom we are to assign them.

No coin, exceeding the value of a denar, seems to have been struck in Norway from the commencement of their coinage to at least the first years of the 13th century, and this sort of money apparently was then most common all over Europe. The shape of the types was usulaly borrowed from English coins, and the first coiners are evidently from England. Godvine at least, who towards the close of the 10th century superintended the mints of the kings of Norway, Sweden and Denmark, bears an Anglo-Saxon name, and Ulf, the mint-master of Harold Hardrade, inserted the preposition "on" on the Norwegian coins. The obverse of these coins accordingly represented the bust or the head of the king together with his title and name, while the reverse contained a cross and the name of the mint-master, or the town, or of both in the Latin language. I may here notice, that with regard to the antiont coins of Norway, the same observation obtains as to those of England. The more antient they are the better is their execution, as the remains of Roman art in the earlier centuries of our era were more and more overgrown by fresh influxes of barbarians. In the period we allude to, only a few traces of the Roman way of striking coins had remained, and still these coins are much superior to those of the 12th century.

Beside the coins bearing types on either side, a large number of small, thin, and hollow coins were struck in Norway at that period, which were called *bracteato* (from bractea, a thin leaf.) It is, according to Mr. Holmböe, a common error to ascribe these coins at an earlier period to Scandinavia than to Germany, as on a careful examination it appears, that no coin of this shape can be assigned to Norway previously to the middle of the 12th century, while the Germans used them already in the 11th century.

The collection, presented to the Society, consists almost entirely of such bracteati, or hollow coins. They are very thin and brittle, and the obverse only has a sign, generally representing a single letter, or a cross of various shape, or any other simple device, while the reverse shews the hollow impression of the same. Some of these devices are accompanied by one or more points variously distributed, and surrounded by two or more circles, which are either plain, or formed of a series of globules. I must not omit here to mention a remark of Clarke (l. c. p. 23) that the cross upon Anglo-Saxon coins, and in the Norman reign is said to have been deeply impressed, that the coins might be divided into halves, &c.

In conclusion, I would notice, that the coins bearing the device of a spiral line and of three concentric circles with a point in the centre are believed to belong to Sigurd, Eistein and Ingo (1142-1155) V. list No. 41-44, those with the letters M. and R. to Magnus the son of Erlin (1161-1184) No. 14-17, and those with the letter G to Guttermus (1204) Nos. 10-12. E. Roer.

Additions to the Catalogue of Nepâl Birds. By B. H Hodgson, Esq.

1. *Merulinæ. Grandala*, Mihi (new).

Bill medial, slender, straight, *Phœnicuran*, but the base rather more depressed and more excided by the nareal fosse and gular flap.

Nares oval, lateral, free, placed at the fore-end of a largish fosse, and shaded above by a small process of its membrane. Gape smooth.

Wings very ample and firm: the first quill bastard, second longest; tertials hardly above half the length of the primaries.

Legs and feet simple, ambulatory, slender and delicate in all their proportions.

Tail medial, firm, forked.

Type. *Gr. côelicolar* (new). The male throughout black internally, but the whole body and head glistering externally with brilliant small-blue: bill and feet jet-black: iris dark. Female sordid slaty, or blue-black with a brown smear, alars and caudals darker: a white bar through the wing: body striped down the shafts with luteous-white: bill and legs uniform black. Total length 9 inches, of bill to gape 13-16 inches; to brow 9-16 inches; tail 3¾ inches; closed wing 6 inches, tarse to sole 1⅛ inch, central toe and nail, 15-16 inches, hind toe and nail 10-14 inches: female smaller, being about 8 inches in total length.

Habitat, the northern region or Cachâr, in under-spots near snows: solitary: insects and gravel in the stomach.

Remark: a singular bird, having the general structure of a Thrush, but with the wings vastly augmented in size and the bill of a Sylvian. Analogous to *Grallinæ*?*

2. *Crateropodinæ? Heteromorpha*,† Mihi.

Bill short, stout, compressed, hard, blunt, entire, as high at the base as long, and much concealed by the frontal plumes; ridges great, curved, and broad; sides flat: tomiæ even: tips equal and obtuse.

Nares small, round, remote, having a raised rim, and concealed by incumbent setaceous plumules. Rictus narrow, furnished in both mandibles with slenderish bristles.

Wings submedial, feeble, bowed, narrow, sixth quill longest; four first much graduated; first plus half of longest: tertials evanescent.

Tail largish, graduated, firm; the separate plumes wedged at their tips.

Legs and feet very stout: the tarsi elevate, with large scales across front-half, and posteal half smooth and sharp. Digits shortish, flattened on soles, basally connected, especially the outer one: the inner fore-toe as long as the outer and stouter; the central not elongated; the hind as long as the lateral fore-toe, stout and depressed. Nails large, moderately bent; sufficiently acute.

Plumage very soft and lax.

Type. *H.* [*Paradoxornis*, apud nos, E. B.,] *unicolor* (new). Throughout of an olive-brown colour, brightest on the fully crested head, and next on the alars and caudals: bill yellow: legs slaty-grey: iris brown.

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* A specimen in nestling plumage has just been received from Mr. Hodgson, having the head, neck, interscapularies, and under-parts, marked with a pale central line to each feather. The bill of this individual is mutilated, but judging from the rest of its external structure, I agree with Mr. Hodgson in considering this remarkable bird much allied to the true Thrushes.—E. B.

† If the several new genera herein adverted to can be properly referred to the *Crateropodinæ*, that group would seem to contain representatives of all the tribes of Perchers, and perhaps should be broken up to be distributed among all of them. All the Crateropons *proper* might be referred to the Garruline group, for example.

Length (total) seven inches and three-quarters; of bill nine-sixteenths; of tail four and seven-eighths; of wing three and seven-sixteenths; of tarsus one and one-eighth; of central toe and nail seven-eighths; of hind ditto ditto three-quarters.

Habitat, the Cachâr: dwells in thick brushwood: frequently alights on the ground, but seems to feed aloft on bugs and other hard insects of trees: in small flocks: not noisy.

Remark: greatly allied to *Paradoxornis,* also to our *Temnoris* and *Conostoma* [*J. A. S.* Vol. X, p. 856]: differs from the first in the smooth level, unarmed and equal tops and tomiæ of the bill.*

3. *Temnoris,* olim *Suthora* (amended)

Bill very short and stout, as high and nearly as wide as long, with broad, greatly curved ridges and subtumid sides: tomiæ even: tips equal and truncate: base much and softly plumed. Rictus smooth. Nares small, round, hidden by a soft frontal zone.

Wings short, rounded, much graduated, yet firm, and tending to a point: 6th primary longest; 5th and 7th hardly less; the two first much, and the two next less, graduated; 1st half the length of longest. Tail longish, much graduated, simple and feeble.

Tarsi strong, elevate, smooth. Toes short, flattish below; unequal: the exterior fore longer and basally connected, the inner fore less, and freer at base; hind stout, depressed, equal to the inner fore-toe. Nails compressed, deep, acute, *Parian*, but less suited for creeping.

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* I have considerable doubts whether, on actual comparison of specimens (especially if recent), this form will prove to be separable from *Paradoxornis.* The *P. flavirostris,* Gould, (apud Horsfield,) was obtained by Dr. McClelland in Assam, and was described by him, under the supposition that it was new, as *Bathyrhynchus brevirostris* in the 'India Review' for 1838, p. 513, and a rough figure given of it. In that description it is stated that the mandibles "meet in an obtuse point in front without a hook," and in my *P ruficeps* (*J. A. S* XI, 177), which in other respects essentially accords with the generic diagnosis of Mr. Hodgson's *Heteromorpha,* the impending of the upper mandible (so far as can be made out from the dry specimen) is in the most trifling possible degree, which, from recollection, I think is also the case in *P. flavirostris.* Mr Hodgson, at page 563 of the same volume of the 'India Review,' identified McClelland's *Bathyrhynchus* with his own *Suthora* (since named by him *Temnoris*), and even suspected that his typical species, or *Nipalensis,* might be the same as Dr. McClelland's *brevirostris* but the description and figure which are now furnished by Mr. Hodgson of his *Temnoris Nipalensis* indicate the very inferior size of the latter species, to say nothing of other distinctions, amounting, however, at most, in my opinion, to subgeneric. We have, accordingly, four species now ascertained of this remarkable group, of which three are probably new to Ornithologists in Europe. The diminutive *Temnoris* has recently been received by the Society from Darjeeling. —*Cur. As. Soc.*—Mr Hodgson has just forwarded a specimen of his *Heteromorpha,* and I consider it to be a true *Paradoxornis.*—*Ibid.*

Plumage soft and lax.

Type. *T. Nipalensis* (see 'India Review' [for 1838, p. 32], Habitat) the Cachâr, in small flocks; frequenting brushwood and tall grass: manners of *Parus*, of which it has the entire aspect; but besides its truncated bill it differs by rounder wings and larger and less arboreal legs and feet. Is greatly allied by its strange bill to the last.

4. *Ampelidæ, Prosorinia*, olim *Cochoa* (amended).

Bill moderate, Thrush-like, but much more depressed and greatly excided at base by nareal and gular cavities, and both tips armed.

Nares large, ovoid, free, lateral, and typical. Rictus wide, with short curling bristles which partly tend over the nostrils.

Wings medial, firm; *Turdine*, but rather less acuminate, with the fourth primary longest. Tail firm, rounded.

Legs and feet simple, ambulatory, *Turdine*, but the tarsi shorter though not less strong, and thumbs longer.

Types. *Pr. viridis* et *purpurea* (see *Journ. As. Soc.* V, 359.)

Remark: with the size, aspect, and manners of Thrushes, these birds are typically *Ampeline* in structure, and should stand next to *Casmarynchus*. Both species are amply crested, and have subnude orbits.*

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* The Society has received several specimens from Darjeeling approaching closely to the description of *Pr. purpurea*, but they would seem to be less bright in colour, certainly than the figure given, and have not the tail-feathers similarly pointed. *Vide* my description of a Darjeeling male, Vol. XI, p. 182.—*Cur. As. Soc.* A female has more recently been received by the Society from Mr. Hodgson, and they are the same. *Pr. viridis* I have not seen.—*Ibid.*

On an improved Simpiesometer, " The Tropical Tempest Simpiesometer," just received in Calcutta. By H. Piddington, *Sub-Secretary, Asiatic Society, &c.*

The following Notes were by the kindness of Mr. Lepage, of the firm of Ostell and Lepage, Booksellers of this city, handed to Mr. Simms, of the well-known firm of Troughton and Simms, with a request that they would try the experiment indicated, and manufacture an instrument for me with the improvements suggested. They have done so, and the instrument was exhibited at the August Meeting of the Asiatic Society.

There are two objections made to Simpiesometers. The first, that "they disquiet people needlessly," and the second, that "they get out of order." The first objection it is evident we cannot remedy, for it depends on individual character, on experience, on knowledge, and on many other personal or acquired peculiarities and qualities, over which we have no control. But with respect to the second defect, I think I can point out to the makers of these instruments, two principal sources of it; and these are, alterations in the chemical qualities of the oil, and the shortness of the tube. We cannot (yet) guard against any alteration of the oil, which might affect the gas; but *if* this occurs, it is probably through the chemical action of light upon the oil. I should suggest then, as an improvement, that the glass be covered with a metallic door, to open with a hinge, so that except when observed, the instrument would be in darkness, where pressure and temperature would operate quite as well as in the light, and the glass would be moreover less liable to break.

The next improvement is the main one, and is, I am convinced indispensable to the efficiency of *tropical* Simpiesometers; viz. instruments which are to be of use for any length of time between the tropics. If Messrs. ——— will refer to Colonel Reid's work on the Law of Storms, they will there see in the chapter on "Storms at the mouth of the Hooghly," p. 293 of 2d edition, that in 1833 in the *Duke of York's* Storm the Barometer fell below 26.50 at a temperature of 79°! and I am certain that in many storms it falls at least to 27.00, with a temperature of 80° or more.

Now if Messrs. ——— will try in their receiver the effect of reducing the pressure to 27.00, and keeping the temperature at 80 or 84°, for I have known it as high as this, I suspect they will find that the gas will escape round the curve of the leg, and bubble up through the cistern. In a word, the tube and scale are not long enough for tropical hurricane depressions; and when a ship gets through one of these, the Captain may not improbably find that his Simpiesometer does not act so well as before, and thus the worst character which an instrument can get becomes (and really is) attached to it, *i. e.* that it is "*very liable to get out of order.*" The *Duke of York's* Simpiesometer is still in Calcutta, but gives indications differing half an inch from the Barometer, as I have heard one sent to me for trial gave regularly on an average 0.7 *above* the Barometer standard, and at 28.5 or 27.00 inches of pressure, with temperature 80°, would have been I think useless, or the gas would perhaps have escaped; hence, as I judge the universal complaints against Simpiesometers which have been long in use in tropical countries

The remedy for this last defect is also simple enough, and if Messrs. —— will try it, I shall be glad to assist them in making the improvement known in India, and especially in Calcutta It consists in making the scale and tube long enough to leave at least half of an inch column of oil at pressure 26 00 and temp. 84°, and as I have said before, keeping the Simpiesometer in the dark. I think these improvements would give, if not a title to a patent, at least to a new name, "Tropical Tempest Simpiesometers."

P S.—I have seen in some patent Simpiesometers a contrivance for corking the cistern when moving the instrument If instead of a cork this was a stopper of caoutchouc, and could be screwed down, it would be a great improvement

Messrs. Troughton's note to Mr. Lepage is as follows —

R. C. Lepage, Esq

29th December, 1842 *Fleet Street.*

Sir,—I find that in extreme cases, such as those mentioned by Mr Piddington, the Simpiesometer would get beyond the range of the scale, and suffer the damage described in his letter, moreover, I think that a door to the case in order that light may be admitted only when necessary, a very judicious precaution

If you desire it, we can soon prepare one with the improvements.

I am, &c.

(Signed) W. Simms.

The instrument has just been landed, at a cost of sixty-four rupees, and a brief description of it may be worth putting on record for our distant subscribers The tube is, from top to the bottom of the curve, 18 inches long, the common Simpiesometers being only about 15, and at a pressure of 26 inches, with a temperature of 80°, would still leave about an inch of oil above the level of that in the cistern and I trust it is not likely to undergo any severer trial. There is a slide with (I suppose,) a caoutchouc stopper to the cistern, and the usual register plates at the bottom.

The wooden frame is made very solid, and has a polished brass door in front, with hinges and hooks, and I may mention finally, that it was brought out from England screwed up in the cabin of a ship, and this is indeed the only safe way of getting out these delicate and fragile instruments.—H. P.

Report on the Government experimental working of the Copper Mines of Pokree in Ghurwal, with notices of other Copper Mines. By G. S. Lushington, Esq. *Commissioner, Kumaon and Ghurwal.*

No. 1780.

To G. A. Bushby, Esq. *Secretary to the Government of India, General Department, Fort William.*

Sir,—With reference to your communication, No. 866, dated the 11th November, 1840, I am directed to forward for submission to the Right Honorable the Governor General in Council, the accompanying copy of a report by Mr. Commissioner Lushington, on the results of the mining experiment conducted at Pokhree in Ghurwal.

Revenue Department.

I have the honor to be, Sir,
Your obedient humble servant,
R. N. C. Hamilton,
Officiating Secretary to the Govt. N. W. P.

Agra, the 16*th December,* 1841.

No. 88.

To the Officiating Secretary to Government, North West Provinces, Revenue Department.

Sir,—I have the honor to return the report on the Pokree mining experiment received back with your letter of the 8th November, the omissions adverted to having been supplied.

2. I am not aware of there being any inaccuracies in the report in its present state, but should any be discovered, I would beg the favor of their being corrected in your office if possible.

I have the honor to be, &c.
(Signed) G. S. Lushington, *Commissioner.*

Kumaon Commr's. Office, Camp Reonee,
The 17*th November,* 1841.

Account of the experiment carried on at the Pokree Copper Mine, Ghurwal, under Mr. Wilkin, with notices of other Copper Mines in that district.

In the 83d Number of the Journal of the Asiatic Society, is an account, by Captain H. Drummond of the 3rd Light Cavalry, of some of the Kumaon copper mines visited by him; this account was drawn up agreeably to the orders of the Governor General of India, and extracts from it were published for general information. In this report Captain Drummond suggested, that with a view of obtaining more correct details than were then forthcoming, as to the advantages or otherwise, of working any one of the Kumaon or Ghurwal copper mines under European superintendence, a certain sum should be advanced by Government for an experimental opening of such mine as might appear best suited to the object in view. This proposition received the sanction of Government in November* 1838, the sum of Rupees 2415 was allotted from the public treasury, being the amount of an estimate submitted by Captain Drummond, and the charge of the experiment was assigned to Mr. Wilkin, an intelligent and respectable Cornish mining assistant, who had accompanied Captain Drummond from England. Mr. Wilkin's personal salary was at the same time fixed at 150 rupees per mensem, by orders of the Governor General.

The mine selected, agreeably to Captain Drummond's and Mr. Wilkin's opinion as the scene of operations, is situated near the village of Pokree, pergunnah Nagpoor, Ghurwal, and is generally known by the name of the Pokree mine. The village of Pokree, is distant from Almorah about eighty miles (say seven marches) North, and about seven or eight miles; on the right, or Northern bank of the Aluknundah river; from Sreenuggur it is about fifty miles, or from four to five days' journey for a loaded man. The elevation of the Deothal temple, or as it is commonly called Deothan, above the village of Pokree, is given by Captain Webb at 6,288 feet; the village is, I think, about five to six hundred feet lower, and the mines in its vicinity range from the latter to the former altitude.

Pokree Mine selected as the scene of operations.

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* Letter from the Secretary to Government to the Commissioner of Kumaon, dated 26th November, 1838.

Altitude, Climate, &c. of Pokree.

The climate is excellent, admirably adapted to the European constitution; water good, and oak,* fir and other timber trees abundant. The soil of the neighbori[illegible]villages is good, and the crops are of the usual kind. The roads also from the mines to Almorah, the capital of Kumaon Proper, and to Sreenuggur, the capital of British Ghurwal, are perfectly safe for foot and horse travellers and loaded porters, and though rudely and unskilfully constructed, are kept in good repair by the civil authorities.

In going to Pokree from Almorah or Sreenuggur, the traveller has to cross the *Aluknunda* river by a jhoola, or swinging bridge of rope, constructed of the grass or sedge, termed *bhabur* by the natives, and the botanical name of which is Criophorum canabinum.† There are now on that route two of these jhoolas erected over the Aluknunda, one of which is situated at Kumpryag,‡ where the Pindur and Aluknunda rivers unite, (thus forming one of the Pryags, or holy unions,) and the other at Buniote,§ about five miles lower down. The ascent from the hot valley of the Aluknunda to Pokree is steep and rugged, but the road is safe, and the traveller is amply compensated for the fatigue and labor of the ascent, by the beauty and picturesqueness of the scenery, and by his transit from the hot stifling atmosphere of the valley to the pure and salubrious temperature of the surrounding mountains. Nor could he fail, if interested in such studies, to admire the vast and instructive series of vegetable forms that meet the eye in the ride up from the river; for, leaving the mangoe, peepul, date, and other well known tropical trees at the base, he passes by degrees into the vegetation and climate of European or temperate countries.

The Pokree mines had for many years been known and worked during the rule of the Hindoo Rajas of Ghurwal, and when the latter were driven out by the Ghoorkhas, the Nepal dynasty did not overlook the resources of wealth which these mines were supposed to contain. It is, however, impossible to ascertain with accuracy the amount of revenue yielded from the Pokree mines, under the Hindoo or Ghoorkha* rulers. In the absence of authentic records, tradition has stepped in, and the result is, as usual, gross exaggeration and hyperbole. The older miners of the place, some of whom are still extant, assert, that one of the mines one year yielded 50,000 Rupees profit. How much of this account is true I have no means of ascertaining, but this much is certain, that from the time of the Ghoorkha conquest of Ghurwal, (1803,) up to the year 1838, the produce of the Pokree mines had become more and more scanty, and that when, (towards the close of the above year,) these mines were handed over to Mr. Wilkin, the actual revenue at which they were rated in the public accounts amounted to 100 rupees per annum, and this small sum was eventually remitted for that year, owing to the poverty and utter inability of the farmer to pay the Government demand.

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* Oak and fir were the only woods made use of in the mine by Mr. Wilkin, the oak for frames and the fir for planking. There are three kinds of oaks, the (bauj,) 1, (phuliart) 2, and (tilouj) 3 at or near Pokree, and one fir. The oaks are the (quercus) 1 incana, (camlossa) 2, and (semicarpifolia) 3 of botanists. The fir is the pinus longifolia, and as the wood is highly resinous, matches of it are used in lieu of candles in the mines, also as torches in travelling.

† Royle's Illustrations, page 415.

‡ Elevation of the Kumpryag rope bridge, 2436 feet above the sea, (Capt. Webb.)

§ Elevation according to Capt. Webb, 2294 feet.

Mr. Wilkin commenced operations in December 1838, and from that month to the end of June 1841, the works were carried on under his constant superintendence, with more or less vigor.† The progress made in excavating the adits, varied at different seasons. It appears to have been smallest during the rains, when frequent "break-downs" took place in the mines, and at other seasons the hardness of the ground and scarcity of workmen prevented much progress being made. The total amount of work, according to the returns sent in by the assistant, and expenditure incurred in making them is, as follows:—

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* In Mr. Traill's Account of Kumaon, (Asiatic Researches,) I find 4801 Rupees only given as the Jumma fixed by the Ghoorkha Government of 1812, for the whole province of Kumaon and Ghurwal, under the head of "mines and mint duties." The Ghoorkha rupee was worth about 12 annas, so that in Company's Rupees the sum was only 3600 Rupees. This, however, was merely the Government revenue accounted for by the Nepalese Soobahs to the Katmandhoo Government, what else may have been levied from the former, under the heads of Bhent, Nuzerana, &c. &c. I cannot pretend to say. From the year 1815, (conquest of Kumaon) the revenue derived by the British Government from mines has averaged as follows:—

	Kemaon Proper.	*Ghurwal.*	
Copper, ...	Rs. 12,00 to Rs. 801,	...... Rs. 2,086.	Highest mining revenue of the province, Rupees 5,417.
Iron, ...	,, 1,905 .. ,,	.. .... ,, 226.	

† The workings were carried on night and day, the laborers being formed into gangs, and relieved at fixed hours. Tools were supplied from the magazines, whilst others were made up by Mr. Wilkin's smiths and carpenters; the whole of these expenses are included in the abstract, except the value of the magazine tools, and one or two barrels of gunpowder expended in blasting.

		Fms.	Ft.	In.	Rs.	As.	Ps.
	Progress in December, 1838,	0	0	0	44	11	9
Rajah's Mine—Chowmuttee ditto.	January, 1839,	17	0	0	1[illegible]3	9	0
	February, .	12	0	0	136	2	0
	March, ...	10	0	0	125	0	0
	April, ...	10	1	6	* 213	4	0
	May, . ..	8	4	0	127	1	10
	June, ...	1	3	0	130	14	0
	July, ...	4	3	0	80	9	0
	August, ...	3	2	0	73	8	0
	September, . .	2	0	0	120	4	8
	October, ...	8	1	7	135	15	4
	November, ..	14	3	0	141	2	8
	December, ..	13	4	0	112	5	0
	Total,..	106	3	1	1,594	7	3
	January, 1840,..	13	3	6	151	13	10
	February,.. ..	14	0	0	143	10	6
	March, ...	11	0	0	160	12	0
	April, ...	19	5	2	162	10	3
	May,..	19	4	9	103	5	10
	June, . ..	3	1	0	54	10	6
Operations suspended and repairs made to frames	July, ...	0	0	0	56	15	0
Ditto ditto. In this month the Adit, Chowmuttee adit, broke down at 40 fathoms from the entrance and was partially secured	August, ...	0	0	0	17	6	0
(Same remark,) ..	September, ..	0	0	0	16	5	0
Chowmuttee Adit reopened and partly repaired, and new ground excavated to the extent of,	October, ...	2	0	0	42	5	0
Repairs completed and in new ground Adit driven.	November, ..	0	3	0	96	2	0
	Total,..	190	4	6	2,600	5	4

The amount originally authorized by Government having by the end of November 1840 been expended, a reference was made to the Honourable the Lieutenant Governor, as to the propriety of continuing the workings, and the point having been submitted for the

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* In this is included, 60 to 70 Rupees for carriage of materials from the Delhi magazine

consideration of the Right Honourable the Governor General, it was resolved, that a further sum of 1,000 rupees should be advanced for the prosecution of the experiment in the Chowmuttee mine alone. Mr. Wilkin's personal salary of Rupees 150, was also sanctioned for nine months further, commencing with October 1840, and ending with June 1841.

I annex a Table of progress and expenditure for the above period, *i. e.* from December 1840 till the end of June 1841, when operations finally ceased.

	Progress.					
	Fam.	Ft.	In.	Rs.	As.	Ps.
December, 1840,	7	1	0	74	9	0
January, 1841,..	8	0	0	87	14	0
February,.. ..	14	0	0	86	4	6
March, ...	11	0	0	120	4	0
April, ...	5	3	0	105	6	0
May,..	12	2	0	125	6	3
June, . ..	8	5	5	164	4	1
Total,..	65	11	5	763	15	10
Add former workings,..	190	4	6	2,600	5	4
Grand Total,..	257	3	11	3,364	5	2

The workings above specified were carried on in three different mines, two of which had been worked in the time of the Hindoo Rajas, and one was entirely new. The names of the two old mines re-opened, and worked by Mr. Wilkin were: 1st, the Chowmuttee; 2nd, the Raja's mine; and the following account of the mines and operations carried on in them is contained in a report from Mr. Wilkin, dated July 1841, and which as it also conveys interesting information concerning other Ghurwal mines, I may be excused for quoting almost entire.

Chowmuttee Mines.

"The Chowmuttee mine at Pokree, is situated in talc which rests on dolomitic limestone. It was adopted for the Government experiment, as the one in which ores were most likely to be found near the surface, where the experiment would be least likely to interfere with the revenue, and where the inhabitants were most favourable to the introduction of a new system. The experiment was commenced at the end of 1838, and has been continued to the present time. During this period, an adit has been driven into the mine on the course of the lode 77 fathoms, 0 feet, 8 inches, and an underlying shaft was sunk on it at 28 fathoms from the entrance; a cross cut has been driven north from this shaft 20 fathoms, 4 feet, 0 inch through dolomite quartz, and talcose schist; but without finding any new lode, excepting a small bed of iron ore. A rise of seven fathoms was driven up from the adit at sixty-one fathoms from the entrance, and a diagonal shaft was sunk to meet the rise from whence a gallery has been extended eastward over the adit, 19 fathoms, 2 feet, 4 inches, of which 8 fathoms, 5 feet, 0 inch is in poor ground; 4 fathoms, 0 feet 0 inch in old workings, and 6 fathoms, 3 feet, 4 inches in ground, which in Cornwall would be worked for one-third of the ores. Of the adit, 5 fathoms, 3 feet, 0 inch were in old workings; 42 fathoms 4 feet, 2 inches in ground that would on an average let for one-half tribute, and 16 fathoms, 2 feet, 6 inches in ground that would not pay for working, besides 12 fathoms, 3 feet, 0 inch of the outer part of the adit, in which no ores were found; very little ores have been left visible in the bottom of the adit or the eastern end of the mine, but the mine may improve if sunk deeper or extended further; however, I should prefer working the western part of the mine, where the lode is wider, and the ores of better quality. A ventilating passage was carried forward over the adit from the first mentioned shaft to the rise, and a winse was sunk under the adit three fathoms; besides which, other excavations, amounting to about twenty fathoms of ground were made, and conveniences for clearing ores, workshops, &c. have been built. The expense incurred by this part of the experiment (omitting European superintendence,) has been Rs. 2,846 : 8 : 9, and the return of copper is Rs. 231 : 4 : 4, besides 3 to 400 Rs. which may be expected from ores yet unsold. The roof of the adit now offers a good field for tributers, and if worked on a proper scale, it may repay the expense which has been incurred in driving it; but it is not likely to do so without machinery for cleaning and smelting the ores, which generally contain only 2 or 3 per cent. of metalliferous ores, or from ½ to ¾ per cent. of copper.

"The Chowmuttee lode, after crossing the ridge east of the mine, enters a very compact bason, in which is situated the Doomed Mine; this mine has not been worked to any considerable extent, owing to the abundance of water, and softness of the talc; but it is said to have a good lode in one part of it, the lode then crosses the hill near Deothan, a small village above the mine, and is found near Googlee and Reswarra, where I have seen ores extracted from it; but I do not think it likely to be profitable on that side of the hill.

Raja's Mine.

" The Raja's mine is situated about 450 yards north of the Chowmuttee mine in common dolomite, which rests on talcose schist. It seems to have been discovered by the out-crop of copper in the precipice above the Pokree village, and to have been followed down to a depth of 70 fathoms, at which level an adit was brought into the mine, which must have been driven 100 fathoms through dead ground, (i e. in which no ores are found,) ere it reached the copper formation; how far it had been driven beyond that cannot, be ascertained, but the old miners state it to be a considerable length. There are other adits, by which the mine was worked previous to the bringing in of the deep adit, and the next one above it is said to have been the principal entrance by which the ores were brought out. At the time when the adits fell together, which occurred about 60 years ago, there were three places in which ores were found: namely, the Gajà Chauk, Kumera Chauk, and the Burtwal Kooa; the Gaja Chauk was entered at the level of the deep adit, and worked on so large a scale, as to require timber 20 feet long to support the roof, and finally it became so large, that the miners contented themselves with picking up, at the risk of their lives, the ores that fell down from the roof, until it all fell in together. The Burtwal Kooa was probably on the same lode as the Gaja Chauk, under the level of the adit. The Kumera Chauk was probably on another lode, (Kumera being the name for talc,) the ores of that lode being muddy and requiring to be washed. The produce of the mine at the utmost is said to have been 300 seers of ores, worth 25 per cent. of copper per day, of which the Raja claimed two-thirds, and the remainder was shared by the laborers, who also held land free of rent. This was the best mine in the province, and the old inhabitants of Pokree always spoke of it as a place of great riches. The adit was allowed to fall together during a dispute between Raja Sackrit and his brothers, and though an attempt was afterwards made to open a new adit near the old one, it was never completed. On my arrival here I commenced opening the second adit, (*i. e.* the one next above the deep one,) but found it too expensive for the limited means at my disposal; and it was abandoned after being opened and secured with timber 31 fathoms, 1 foot, 6 inches, at an expense including native superintendence and materials of Rupees 346: 12: 8. To open the mine properly, both adits should be repaired, and two new shafts sunk from the surface into the mine, which would cost about 4,000 Rupees, and it would be necessary for the proper working of the mine. No information can be obtained as to the number of lodes in this mine, but I think there are three, on the north one of which the new mine is situated, about 60 fathoms north-west of the Raja's mine."

New Mine.

"In the new mine the lode was very promising, and yielded good specimens of ore near the surface, but at a depth of 15 fathoms it became poor, and was consequently abandoned, after being extended 23 fathoms, 3 feet, 0 inch, at an expence, including native superintendence and materials, of Rupees 245: 11: 0."

In addition to the above three mines, in which Mr. Wilkin's operations were carried on, there are several other copper mines in the vicinity of Pokree, some of which were worked in former times by the native miners, and some again have never been tried. None of these were attempted by Mr. Wilkin, but I find on his report the following notices of them, and as the opinion of the practical miner must be infinitely more valuable and satisfactory than any remarks that I could offer, I consider it right to extract them.

Nota Mine.

"Nota mine is situated about two and a half miles north-west of the Pokree mines, in talc, which rests on dolomite limestone. The lode is a bed of yellow or buff coloured talc, about four feet wide, dipping north-west at 50°; it rests immediately on the dolomite limestone and has a sulphuric effervescence on the surface. This mine is said to have been rich; it is situated on the western side of an extensive bason or valley, on the eastern side of which ores have been turned up by the plough, but no mine has been worked. This is an extensive field for mining, as the lode may be productive throughout the bason or valley. There is wood and water for all purposes near this mine.

"The Thala mine is situated about a mile north-west of the Nota mine, probably on the same lode, in an extensive plain, or comparatively level surface. It was first worked in 1810, and again in 1825; but there being no good facility for adits, the water prevented its being worked to any considerable depth. The miners who worked it state the ores to be copper pyrites disseminated in a lode of two feet wide, one-fifth of which was metalliferous. An adit of fifty fathoms in length would reach the mine ten fathoms below the surface; below this adit a machine might be erected, which with the surface water and that of the mine would continue to work throughout the year, and keep the water of the mine to a considerable depth. There is plenty of wood for all purposes in the neighbourhood of this mine.

Thala Mine.

"The Danda* mine is situated on the hill, about 500 yards above Thala mine in chlorite slate and talc, which on the north-western side, comes in contact with common dolomite. This mine has been worked to a considerable extent, and is said to have yielded 52,000 Rupees profit in one year. The ores are of good quality, and found in three or four different beds or lodes, which dip into the hill at an angle of 30°. The chlorite slate, in which the beds of talc and ores are found is so hard as to stand without timber; it also contains finely disseminated copper in small quantity. The lodes run into a fine fall or bason westward, in which, I think, they would be found productive. There is abundance of wood near this mine; but no water for machinery nearer than the Thala mine.

Danda Mine.

"The Talapoongla mine is situated about a mile north-east of the Danda mine in talc, which rests on dolomite limestone. The strata, in which the ores are found, is about six fathoms wide, dipping south-west at various angles. The bed is extensive, but the ores are scarce; however this might improve at a distance from the surface; hitherto little has been done, except washing away the strata during the rainy season. It has good facilities for wood, water and adits. Ores have been found in a pre-

Talapoongla Mine.

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* A ridge or crest of a hill is called Danda in the hill language, and this mine being on the ridge, gets the above name.

cipice, east of this mine, near the village of Bungtul, but at present the outcrop is covered with rubbish; it is in the talcose formation, and has good facilities for working.

Khurua Mine.

"The Khurua mine is situated in the ravine below Bungtul, near its junction with the Nugol river in talc; it was discovered by the water of the ravine washing away the strata, and leaving a quantity of ores exposed to view; these ores were taken away by the Pokree miners, and the mine worked five or six fathoms under the surface, beyond which they were prevented from going by the water. They tell me that the lode at the bottom of the mine for two fathoms in length is one foot wide, of solid copper pyrites. Of late years, nothing has been done at this mine beyond washing among the surface, which contains a small quantity of copper pyrites. There is plenty of wood in the neighbourhood of this mine, and water for machinery, but no facility for adits."

Such is the account given by Mr. Wilkin of the copper mines at, and in the vicinity of Pokree, the whole of which he has repeatedly visited and examined, as far as the nature of the ground would permit. Of other copper mines situated in the Ghurwal district, the most celebrated are the Dhunpoor* and Dhobree mines, the former being on the north, the latter on the south side of the Dhunpoor chain of mountains. This chain, rising to an altitude of 9,500 feet above the sea, is on the south or left bank of the Aluknunda river, directly opposite to the Pokree hills, and to the great Himalyan chain, covered with eternal snow. The view from the crest of the Dhunpoor, ridge is beyond description beautiful and majestic. The great castellated peaks of Budrinath rise directly in front of the spectator, and on either side of these as far as the eye can reach, appears a long succession of other snowy peaks ranging in form and altitude; but all and each surpassingly grand and sublime. No view that I know of in Switzerland, equals this in vastness and extent; and in altitude the peaks of Gungotri, Kedarnath, and Budrinath to the left, of Trisool,

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* These mines are leased to a farmer at the sum of 1,900 Rupees per annum. Some villages are attached to the mine, and the land revenue derivable from them is included in the above. It would amount to about 200 Rupees per annum as a separate item. The inhabitants of the villages work in the mines, and receive a share of the produce; they are what Mr. Wilkin calls "tributers."

Nundadevi, Purychoola, and Kylas to the right, fully merit the title bestowed upon them by the Shastra,* of "Mountain Kings." Mr. Wilkin reports, that "the Dhunpoor mine is situated on the north side of a high† and precipitous range in compact dolomite." The ores of this mine are principally copper pyrites and grey or vitreus copper ore with the red oxide, and green carbonate in smaller quantities: the latter being scarce. The ores are found in a bed, (or channel of ground fifty or sixty feet wide,) which runs nearly north and south, and underlies east about one foot in the fathom. It is divided by a bed of potstone or indurated talc, which runs through the copper formation longitudinally, conforming to the strata, and having a frith or *flukan* on the western side.

Dhunpoor Mine.

"This lode of potstone will facilitate the driving of passages into the mine, and it is sometimes productive; but the greater part of the ores are found in the adjoining rock in seams and branches, which cross it in every direction. The seams of ore are said to be one foot thick at times, but generally they are less than one inch thick, and any thing more than that is considered a prize by the miners. When I visited the mine in 1838, the best seam or vein which I saw was not more than half an inch thick; but on my last visit in 1841, I saw one two inches thick, and I was informed that it had been one foot thick during the interval between my visits. It is perpendicular, and cut out at the bottom of the working by a horizontal vein which carried it eastward; the ores are mostly within one foot of the horizontal vein, above which it dwindles away to the size of a reed. All the other places which I saw, were poor in comparison to this. The ores are the softest part of the rock, and are consequently dug out first, after which the miners burn the rock with wood and then throw water on it. Owing to the calcareous nature of the rock, this process facilitates the work considerably; but still I think blasting would be cheaper, as the burning does not penetrate beyond a few inches in the rock, and the passages are consequently small, except when two or more veins meet. The veins are so numerous, that the rocks between them are seldom more than 3 or 4 feet thick, so that it would certainly be better to have a large working, which would include a number of veins, than to work on the present diminutive scale. The mine is so full of rubbish, that it is difficult to get through the passages, for nothing is brought out of the mine but the ores, and the rubbish being left within, fills up the mine and impedes its future working. At the present lowest working of the mine, there is a commodious passage on the claystone lode, 60 fathoms in length; but the outer 20 fathoms has crushed together; below the inner end of this passage, there is an extensive old working, which is said to be rich, but the present generation of miners have never been able to get the water out of it; beyond this, the mine has been worked to a considerable extent, but the passages were so full of rubbish, that I could not go into them. An attempt was made to bring in a new adit to drain the mine to a deeper level than at present, previous to the Ghoorkha rule; but after being driven 15 fathoms, it was abandoned owing to the ores in the mine failing, and the laborers being sent to the Nagpoor (*i. e.* Pokree) mines, which were then rich. No attempt has been made since then to drain the mine below the level here spoken of. The lessee informed me, that he formerly realized from three to four thousand Rupees per annum from this mine, but that lately, the profits have been very small. I am unable to give a correct section of this mine, but the following will convey a tolerable idea of its leading passages, and the rest may be considered a perfect honeycomb from entrance to end.*

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* Captain Webb gives the following altitude of the Dhunpoor village, 7,956 feet; the mine is a few hundred feet higher, and the ridge above the mine in some places is rated at 9,500 feet above the sea.

† The repeated allusions to the great Himalyan chain in the sacred books of the Hindoos, are too well known to require quoting. The names assigned to some of the peaks are, I think, appropriate and poetical: such as Kada-nath, Lord of water; Roodra-nath, Lord of the Roodras or Demi-gods.

"There is water for machinery in the ravine below the mine. Wood for all purposes is rather distant, but owing to the supply of labour, charcoal is cheaper here than at Pokree, where the wood is nearer. The smelters at this mine are very industrious and expert at their work, and their mode of smelting is superior to any other in the province, excepting the Dhobree people, who work on the same principles, using abundance of decomposed felspar and limestone flux.

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* As there is nothing of interest in this sketch we have omitted to copy it.—Eds.

Dhobree Mine.

" The Dhobree mine is situated on the south side of the Dhunpoor range, in very nearly the same kind of rock as the Dhunpoor mine; but in this mine, most of the veins are horizontal, running along the side of the hill. At the surface they are very small, containing oxide of iron and green stains of copper, and occasionally copper pyrites. The present working mine is not extended very far from the outside of the precipice or surface, the ores being much the same near the surface as at a distance from it. When the miners find their passages growing long and tedious, they begin outside on a new vein. There are several old mines west of the Dhobree village; on entering one of them, I found it very extensive, the ores seem to have been most abundant where the horizontal vein was crossed by perpendicular ones; but as far as I went, the whole of the horizontal vein had been taken away, and often crawling to a considerable length, I was obliged to return for want of torches. I got a small specimen of ore from one of the perpendicular veins, of which there were two or three running south-east and north-west. The western one of these veins is said to have been very rich, but it fell in about the time* the Ghoorkhas entered the province, and has not been opened since. The ores of these mines are principally copper pyrites, worth about 25 per cent. of copper.

" There is water for machinery about a mile and a half below the mine, and wood for all purposes near that place. There is another mine on this range at Molghirree; it is rented at 25 Rs. per annum, and said to be in the same rock as the Dhobree mine. There are other mines of both copper and iron in Dhunpoor, but none of them are worked, nor have I seen them."

Results of Pokree Experiment.

From the following memorandum, it will be seen that the experiment conducted by Mr. Wilkin has entirely failed, as far as a profitable return for the capital expended is concerned.

Memorandum of expenditure on account of the Government experiment at *Pokree* :—

Paid to Mr. Wilkin from the Almorah Treasury, ...	Rs. 3215 0 0

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* 1790.

Expended in working the mine as per monthly statements,…… …………Rs.	3364	5	2			
In which is included value of Copper sold by Mr. Wilkin, and carried to account, amounting to,…………………	149	5	2			
Total expense to Government,				3215	0	0
Deduct value of Copper sold and paid into Treasury,………………………	272	3	3			
Ditto of Copper sold, but not yet realized,	358	0	0			
				630	3	3

So that when this last item has been realized, the account will stand thus:—

Expended,…… ………………	3215	0	0
Returns,………… ………	630	3	3
Balance against the Experiment,……… ………	2584	12	9
Exclusive of the cost of European Superintendence, at the rate of 150 Rs. per month for 32 months,…………… ………	4800	0	0
Total Rs.	7384	0	0

This result is in my opinion to be attributed solely to the poorness[*] and scarcity of ores found, and not in the least to any want of skill, zeal, or patience on the part of Mr. Wilkin, of whose intelligence, activity and trustworthiness I have a very high opinion, and every mining undertaking is, after all, more or less a lottery. In this particular instance, every thing has, I conscientiously believe, been done that was practicable with reference to the means placed at the superintendent's disposal, and if the result has been a failure, it cannot in fairness be attributed to him. If it be urged, that the fact of the Raja's and Chowmuttee mines having been worked in former times, ought to have suggested the probability of the lode being exhausted, it should not on the other hand be forgotten, that the sum placed by Government at Mr. Wilkin's disposal was not sufficient to warrant his devoting the whole of it to a new mine, which after all might have proved equally barren as these. Native accounts represented these mines to have been rich and productive at the period of their abandonment, and the miners of the place still hold to this belief. Nor was it in the first instance suspected, that the mine had been so far penetrated into

[*] Poor, with reference to the means of smelting.

as has been proved. Taking these points into consideration, I see no reason for believing that course adopted was injudicious.

States that he cannot recommend further Experiments.

The failure of this undertaking renders it impossible for me to record an opinion in favour of fresh experiments being made under European superintendence at Pokree; I fear no such experiment could pay at that place, and with regard to the copper mines of the province generally, I have reluctantly come to the opinion, that they do not present a fair field for the employment of capital on the following grounds:—

1st. The great distance of the Pokree and other copper mines of Ghurwal from the markets to which their produce would have to be brought.[*] 2d. The absence of water carriage, and slowness and expense of carrying articles of bulk in a country like Ghurwal. 3d. The non-existence of coal and the cheapness of English copper, carried as it is entirely by water to the great commercial towns of Upper India. The above circumstances would, I apprehend, be insuperable obstacles to the success of any speculation of the kind. For supposing even that a rich and abundant copper mine should hereafter be discovered, and that by European superintendence and the aid of machinery, great improvements were made in every process of mining,[†] and the price of the article (which now sells at the door of the mine at a dearer[‡] rate than English copper does in the plains,) were to be greatly reduced, I still think, that the cost of transporting it to a good market would absorb all returns, or leave little profit to the speculator—further that this profit would be in the course of a few years (if operations were carried on to a large extent) cease, and the works be abandoned owing to the non-existence of coal. This is not a mere conjectural hypothesis, but rests on what has already occurred, and will again occur in this district. Even under the present petty system of operations, many mines have been abandoned from this cause. The following is an instance of the kind. In the valley of Kheisaree, the northern extremity of which forms the boundary between Kumaon and Ghurwal, iron ore of a good quality is found in great abundance, and many mines have at different times been worked by the native miners, who resort thither annually from the eastern purgunnahs. At present, the chief supply of iron in Kumaon is from these mines, yet although the total quantity produced would with reference to the gigantic scale of English transactions appear perfectly ludicrous, the valley has notwithstanding become nearly denuded of trees, and it is only by shifting about to new sites, less removed from the forest, that operations are now carried on. The extensive pine woods of the Doorgadhee and Jowrasee range, even at the distance of five and six miles from the mines, are now beginning to experience indiscriminate havoc at the hands of the charcoal burners, who cut down and leave to rot on the ground thousands of fine trees, merely consuming the smaller branches, (to save themselves the trouble of splitting the large trunks,) while no provision is made for the renewal of the forest.

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[*] The copper mines of Kumaon Proper, at Seera and Gungoolee for instance, are also, all situated far in the interior of the mountains. The talcose and calcareous formations in which the ores are found, occupy the high precipitous mountains, which (in this province at least,) separate the mica slate, gneiss, and not unfrequently granite of the central hills from the similar rocks which build up the buttresses and compose the peaks of the great Himalayan chain. This mighty chain itself appears to be partially metalliferous, judging from the lead mines at Ghertee (now waste) between Melum and Neetee, the copper indications at Tola and elsewhere in the Jowahir Pass, and the ores of the latter metal and of iron actually found and worked at and about *Polan* in the immediate neighbourhood of Roodurnath, one of the snowy shrines between Kedernath and Budrinath.

[†] The washing and smelting of rich ores under the native system costs 50 per cent. Poor ores do not pay.

[‡] Wrought copper sells in the hills at 1 Rupee 12 Annas to 2 Rupees per seer, equivalent to 70 to 80 Rupees per maund. English copper can now be brought at

As compared with the Pokree and other mining localities of Ghurwal, the Khetsaree valley is, in many respects favorably situated, being four days nearer to Chilkea, to which mart the route is almost entirely through a level country, and bisected by the Ramgunga river, the power of which, and some of its nearer affluents, would be ample for every kind of machinery. Limestone too exists in great plenty, and in skilful hands, would doubtless be turned into large use in the reducing processes. The climate, however, in the valley itself, is unsuited to the European constitution, and until the last few years

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Almorah at a less price than the hill copper, the *present* price of the former being 1 Rupees 10 Annas per seer, of the latter 1 Rupee 12 Annas to 2 Rupees.

By recent quotations, the price of imported copper at Calcutta is shewn to be as follows; viz.

Sheathing, per Factory maund, ...	36 12 to 38 0	Sicca Rupees.
Brazier's, ...	36 0 to 0 0	,,
Old Copper, ...	37 8 to 37 12	,,

during which its surface has been gradually drained and brought under tillage, it was considered scarcely habitable to natives. But as the surrounding heights afford salubrious sites for residence, and as population is fast increasing in the valley, an experiment would in all probability succeed at Khetsaree, if to its other advantages could be added a sufficiency of fuel; but the forest is rapidly disappearing, and burnable coal is as yet unknown. It is true, many *indications* of the latter fossil have been found in the Sub-Himalayan ranges, as for instance at the Bullea bridge between Bheemtal and Bhoumouree, and in the streams which issue from the hill north of Nujeebabad; yet the few poor and immediately exhausted seams of lignite here and there discoverable in the sandstone strata, and upheaved debris of the Sewalics between the Jumna and Ganges, and again between Hurdwar and Bhoumouree, would seem, if *shewing anything*, rather to point to carboniferous beds buried far beneath the base of the lower ranges, than to hold out hopes of their existence near the surface of the secondary rocks, or among the primary formations, where the iron and copper ores are developed.

If happily and unexpectedly, real coal, fit for consumption, and in sufficient quantities, should hereafter be found in the strata opened to view by the Bullea and other streams issuing from the southern face of the Ghagur mountains, or by the Kosilla and Ramgunga in the lower part of their course, the iron mines of Ramghur, now second in importance to Khetsaree, would become of great value; the noble steppes of the Ghagur would be spared from the denudation which now threatens them; and as the intermediate country is easy, and opposes few obstacles to the formation of roads, the mines of Khetsaree would share in the benefits of the discovery.

I have thus enumerated the great obstacles to the success of any mining enterprize of the kind under discussion. On the other hand, there are some considerations to which I proceed to advert, which might at first sight appear to warrant a contrary conclusion. I first allude to the possibility of obtaining a sufficient supply of labor; and secondly, to the character of the people. 1st. With regard to labor; of this I think the supply would be found to be sufficient at the rate of 2* to

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* Two annas per diem is the usual rate of hire, but to ensure a constant supply, it would probably be found necessary to raise it to 3 or 4 annas.

4 annas per diem, as none of the hill men appear to have any objection to working in the mines as labourers. The mining, or Agaree caste is, it is true, one of the lowest, but Brahmins, Rajpoots and Khasyas do not object to work as labourers in the mines. I have seen all of the above castes working under Mr. Wilkin at Pokree of their own free will, and have myself often employed them when in the district (also of their own free will) in duties which in the plains, are usually performed by coolees; such as digging, cutting wood, fetching materials for building, &c. 2ndly. With regard to habit and disposition of the people, the natives of Pokree, and generally speaking, of Ghurwal, are docile, good humoured and willing, inferior in point of physical strength to the European; but still capable of performing a very fair amount of work, if well looked after. In common with most Hindoos, they possess the great virtue of sobriety, and for honesty, are remarkable. Nor are they long in acquiring the use of European tools, even of the pit-saw, the manner of working which is so repugnant to native ideas of ease and convenience. With regard to crime, I may state, that robbery, murder, and, generally speaking, all heinous offences, are rare in Ghurwal. I know not how it is, whether it be owing to the nature of the country, the scantiness of the population, to amiability of temper, or want of energy* and spirit; but this fact is certain, that violence and a recourse to bloodshed seem to be almost unknown. If two Ghurwalees quarrel, they seldom proceed to blows, or should a fight actually take place, it is not of that sanguinary and reckless kind which occurs so frequently in England and elsewhere: such are the bright traits of the Ghurwalee character. On the other hand, they are credulous, ignorant, and superstitious to a degree; believing in ghosts, the evil-eye and witchcraft, and by no means remarkable for a love or practice of truth, where they consider it their interest to speak falsely. Still on the whole, weighing the good against the bad, I have often been struck by the many excellencies of their character, and strange though the statement may appear to be, I have at times felt inclined to believe, that compared with similar classes of our own country,

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* I do not think the Ghurwalees are wanting in courage, and believe they have proved themselves efficient as Sipahees in Cabool, where many of them are serving in H. M. Shah Sujah's Force.

with all its boasted knowledge and civilization, they would present as many points for approbation as the latter.

I will conclude this report by shortly summing up what I take to be circumstances *for* and *against* the success of any mining speculation in this province. The obstacles are: 1st, distance of the mines from the low country; 2ndly, slowness and expense of carriage; 3rdly, cheapness and abundance of English copper; 4thly, superficiality of the mines yet known; and 5thly, want of coal.

The favourable points of view are: 1st, the excellence of the climate, and 2ndly, the quiet habits and tractable disposition of the people. To my judgment, the reasons urged against the employment of capital appear greatly in excess of those in its favour. If I had funds of my own lying unemployed, I would not, with the knowledge I have of the circumstances of the case, invest them in any enterprize of the sort. In stating this much, I would add, that I am by no means anxious to deter others from embarking capital in a new experiment, should they, with reference to the account of progress, expenditure and returns now submitted, be of opinion, that my view of this matter is incorrect, and that different results would have been obtained, had the expenditure, or first outlay consisted of thousands, instead of some few hundreds of pounds.

(Signed) G. T. LUSHINGTON, *Commissioner.*

P.S.—Specimens of copper ores from the *Pokree* and all other copper mines of this province have been called for, and will be submitted when received, with names of mines, pergunnahs, &c. &c. My report of 7th June 1839, forwarded to the Secretary of Government N. W. P. at Agra, was accompanied by tabular statements, shewing the number of mines, and amount of revenue derived from them in Kumaon and Ghurwal, and can be referred to, if necessary.*

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* We have applied for a copy and permission to print this.—EDS.

Brief History of Kalat, brought down to the deposition and death of Mehrab Khan, Braho-ee. By Major ROBERT LEECH.

INTRODUCTION.

It had been my intention to delay writing on this subject, until I could procure a written history of the Ahmadzyes, which I have reason to believe is in existence, and until I could obtain a collection of national ballads from the hereditary Brahoee *sha'ars*, or minstrels; but the interest at present felt in every thing relating to Balochisthan, arising from the disturbed, and to many no doubt, inexplicable state of affairs in that country, has induced me, perhaps prematurely, to attempt the task; and for being able to perform it I am chiefly indebted to a Persian manuscript, drawn up in the summer of 1838 at my request, by Myan Sibaghatulla, Sahabzadah of Sarhind, whose family had been settled at Kalat for nearly 50 years.

Mistakes will no doubt be found to exist, as I have had no opportunity of corroborating the original accounts, but I am confident they will all be found, if any, in the early history, and thus only be liable to mislead the curious antiquary, and not the operative politician.

Cabool, 1st June, 1841.

P. S. Myan Sibaghatulla, it must be told, while at Kalat, was a partisan of the wakeel's family.

The word Kullat.

The word Kullat, in Arabic, signifies a mountain-top: and the word Kalat, in Persian, is applied to a fort built on a commanding eminence; in this sense there are three Kalats familiar to the natives of Central Asia; viz. Kalat-i-Nadio to the N. E. of Mushud; Kalat-i-Ghilzye to the E. N. E. of Candahar; and Kalat-i-Nasseer, the capital of Balochisthan. In the Balochee language, which is corrupted Persian, Kalat is applied to a fort in general, and here it is used *par excellence* as "the fort."

Kalat-i-Sewa.

This fort was formerly known as Kalat-i-Sewa, from a former Hindoo ruler, by name Sewámal: and his being known by this name militates against the supposition entertained by Pottinger, of Sewa being an hereditary title in the family, which is reputed to have been of Rajpoot extraction, and Sewa's title was therefore no doubt the military one of Singh, and not the mercantile one of Mal.

Kalat-i-Baloch.

Kalat-wa-Neecharah.

The Afghans know the place merely as Kalat-i-Baloch; and in the royal letters patent and mandates of the Duranee kings, the small place of Neecharah is entered with it, as "Kalat-wa-Neecharah," in compliment to the tribe of Neecharahs, who include themselves in the Alakozyes, and boast that their village of Neecharah contains the tomb of their progenitor Alako.

Kalat-i-Nasseer.

On the accession, or after the time of Meer Nasseer *Khán*, Mehrab *Khán's* grandfather, the fort became known as Kalat-i-Nasseer, which appellation it at present retains.

Hindoo Antiquities.

The place of the greatest antiquity in Balochisthan is the island opposite port Pasanee, called erroneously Sungadeep, but correctly Ashtalla, and also correctly Carmine by Nearchus, if we regard the word as a corruption of Carline, or Kalyayan, (from Kalee, the goddess of fate, and Ayan, abode.)

Sata-dweep.

It is at present known as Satadweep or the island of Sata, (Astula, or Kalee,) According to existing tradition it was once inhabited, but the inhabitants were expelled by the presiding goddess, in her wrath at an incest that was committed there. Pilgrims say, they are now only allowed to remain on the island one night.

Hingulaj.

Another place of Hindoo antiquity is Hingulaj, (from Hingula, a name for the goddess Kálee, and j, an affix importing position.) There are two places which pilgrims visit; one in a defile of the Hingulaj mountain, through which the river Agher runs, where there is a pool of water and a natural cave, containing a natural pillar, between which and the sides of the cave sinners find a difficulty to pass, while saints experience none; and outside this cave there is a natural platform in the rock, where goats are sacrificed to the presiding goddess Hingula.

Another is an ebullient (not hot) well, in which offerings are thrown, which, when emitted by a successive ebullition, form ingredients of thick cakes, baked on the spot by the pilgrims, who keep fragments as relics. The pilgrims wear as a distinguishing mark of the order of Hingulaj, a large string of small clay beads, which are to be purchased at Thattah.

Other Pilgrimages.

Besides these two shrines, the following verse serves as a guide to Hindoo pilgrims in Balochisthan:—

> " At Kalat you may see Kalee ;
> And at Mustung, Mahadave ;
> At Shal is the old Jogee ;
> Panee-nath's grave."

Alexander the Great.

No tradition is preserved of the march of Alexander the Great through Balochisthan, with the exception perhaps of a mountain pass near Sarhad, called Lak-i-Lukman; Lukman being a fabulous philosopher whom Alexander released from a well in *Baghdád*, where he had been for forty years confined by enchantment.

At the same time, I believe that Alexander the Great is not connected in the minds of the inhabitants with the legend; but that regarding the work of cutting a pass through a mountain as one requiring great science, and knowing it to be a work of antiquity, they have given the credit of it to one of the only two scientific men of old known to them; viz. Lukman, the other being Plato.

The inhabitants of the coast of Mukran also know, by tradition, that an army was formerly reduced to great straits in taking the coast route from want of water and provisions.

Bampoor.

Bampoor, (originally I have no doubt Bramhpoor,) must always have been, if not the capital of Western Balochisthan, at least one of the chief towns, from its fine natural supply of water.

Mukran.

In forming conjectures on the derivation of the word Mukran, it struck me as singular, that the word in Hindoo looked like the word Kirman; the letters changing places; as in the words chik-al and kick-al, mud.

I have heard of a rather ingenious derivation proposed in *Mahee Khoran* (fish eaters,) or michran. The Scindians are at the present day called in derision fish eaters. Nearchus says, that the Icthyophagi believed themselves to be descended from a race who had been once transformed into fish or sea monsters. If this tradition was then in existence, and the inhabitants believed it, their country might have been known as Mekrine (Maharayan, the abode of sea-monsters.) There is something of this tradition still preserved. The island of Satadweep is said to have been depopulated by the presiding goddess, on account of the commission of incest there.

Kech.

Kech may have been the same with Bramhpoor, if we regard it as reducible from Kánj, a name of Bramhá. Or it may be drawn from Kesh, a name of Vishnoo, when no doubt the town was called Keshápoor.

Saiful Malook.

Of great antiquity also are the caves near Belav, called after Saiful Malook, and more than one account has been given of them.

Gabers.

The whole country of Balochisthan abounds with the remains of what the natives at the present time believe to have been the works of the Gabers, or fire-worshippers; indeed the remains of any kind of solid masonry suggest to them the Gabers as the founders. The following are some of the sites of such remains; viz. in the defile of Jurgee; between Neechárah and Kapoto, at a place called Gat near Zahree; at Zeedee; at Dashtee Gorán near Kalát; at Keel in the Moora Pass; at Kuchakánee in the Tákáree Pass; near Bapow in the Moora Pass; at Mishk between Zahree and the Moora Pass.

Kalat Antiquities.

The chief antiquity of Kalát itself is a Hindoo temple, dedicated to the Devee, or goddess Kálee or Durgá, the consort of Shiwa, which is believed to have been in existence even long before the time of Sewá. Again, some say, that the latter was ordered in a dream by Kálee to people the neighbourhood of the temple. Mehráb *Khán* had a respect for the fakeer of the temple, so much so, that when he died, the *Khán* gave him a piece of gold cloth for a shroud.

Another antiquity, but of more recent date, is the grave of a faqueer near the Kalát spring, who is said to have considerably enlarged it from what the original inhabitants or Dehwárs made use of. The faqueer is respected both by Mahommedans and Hindoos.

> "While living, Oorfee! so behave thee,
> That when thy life time doth expire,
> Mahommadans with "Zamzam" lave thee,
> And Hindoos burn thee on a pyre." *From the Persian.*

In Sewá's time, the summit of Kalát only was fortified, and that even very partially, which is now called the Meeree, (or citadel,) an expression peculiar to Balochisthan, as in other parts of Khorasan it is called Arg, (Meeree meaning literally, "place of the Meer.")

There are no vestiges of Sewa, except in a part of the present building, between the rooms occupied by Mehrab *Khan's* mother and by his son; there is a small room known as "Khudee-i-Sewa," or Sewa's cabin; and whenever the slave girls get ill there, they attribute it to being possessed of one of Sewa's devils.

Brahoee.

The term Brahoee I consider must have been given this people by the original inhabitants of the country, on their first entering it. I believe the word to be a corruption of Ibrahimee, Brahimee, or Brahiwee, as a race either invariably takes its name from its progenitor, or its original country. I have never heard it used in contradistinction to Naroee. Pottinger believes the word to have the same meaning as that of Rohilla.

Rambar.

The only antiquity of these people I ever heard of, is a boundary stone near Mashkai, called "Sang-i-Kumbar," where the Rambaranee patriarch no doubt fixed his boundary with the aborigines on his first settlement.

Tombs.

The latest reminiscence of the past is to be found in four grave yards under a hill to the east of Kalat. The western contains 15 or 16 graves of Ahmadzyes. The eastern, whose dome cannot they say be covered, is that of *Sakhee* Meer Samandar, (the Sambar of Pottinger?)

Between the two is a yard containing the tombs of Meer Nasseer and Meer Mahmood *Khan*, and between this yard and the dome of Meer Samandar, is the burial ground of Meer Shahnawaz *Khan's* family.

Dehwars.

The oldest inhabitants of Kalat are said to be the Dehwars, or land proprietors. I do not look upon them as a distinct race, but as descendants of the different lords of Kalat, who have after being conquered, sunk down into tillers of land. The present race, like the other Tajuks of Khorassan, speak Persian, corrupted with the local neighbouring dialects. The Dehwars of Kalat corrupt their Persian with Hindustanee, Pushtoo, and Braho-iky. The following is a specimen:—

Jargoa.

Warnáreesá, hamáueemá raftam-hamanjá yak kad ebood, aspia khuree kardam, azanjá puthareed, páash ba kad-i-moosh darámad, ragh ash taleed, mantharak zadam, sheoshudam, náf-i-man taleed wa dil-i-man budeed.	Old fellow, this moment I went over there, there was a hollow there. I spurred the horse, he jumped over it, his foot got into a mouse-hole, he sprained his nerve, I made a spring and came down. I sprained my navel, and my heart got sick.

These Dehwars are divided into five takars or clans.

I do not conceive that Sewa had any government; but rather that Kalat was first built by him, and considered his estate.

Georgians

Tradition says, that Kalát passed into the hands of Persia from those of Sewá, and that the governor of the place was of Georgian extraction, who had a deputy at *Khuzdar*, and ruled over the clans, who were divided under separate Maliks and Arbabs.

This governor, after some time, losing controul over his passions, commenced a system of gross tyrannical debauchery, carrying off by force the daughters of the peasantry, and this was carried to such an extent, that the whole population was roused, and the heads of clans determined to administer the remedy with their own hands.

The deputy was much worse than his principal, as he not only required their daughters, but an entertainment of halwah, (a *blanc mange,)* which he had brought to him on a hill which is now called Koh-i-halwah, where the governors of *Khuzdar* now go to hunt.

The governor had for some time been in the habit of requiring *gratis*, and daily, the services of 25 Dehwars to build the defences of Kalat; such was his fear of their revenge, that before admitting them on the works, he had their persons searched to prevent their bringing in weapons concealed about them.

They were in the habit of baking bread of millet in large balls, with a heated stone in the centre, to provide for a thorough baking, called by the Affghans *kak*, and it occurred to them that this might be the means of their release, and the weapon of their vengeance.

Revolution.

Next day they passed the guards without any suspicion being attached to their bread, and finding the tyrant in a mid-day sleep, dispatched him; the town was immediately surprised from without, and the Dehwars became masters of Kalat. On the news reaching Khuzdar, a similar rise took place there, which terminated as successfully.

Brahoee History.

The descendants of these patriots are now known among the Dehwars as "*dodee mast,*" or "bread heroes."

Before entering on the history of the Brahoees, I must preface the subject by remarking, that the history of these people is in the hands of the Lohree minstrels, but that I heard from Mehrab Khan himself, that he could trace his desent for twenty-three generations, and that his progenitors emigrated from Halab, (Aleppo).

He also declared himself descended from Ameer Humza, uncle of the Arabian prophet, and a Hashamite Koreish.

Though not in possession of Merab Khan's pedigree, I procured in the early part of 1839, when in Cutchee, that of Baloch Khan Dombkee of Lahree, who traces it to the same source as the Khan of Kalat does. It is as follows: Baloch Khan, son of Mehrab Khan, son of Jalal Khan, son of Shahdad Khan, son of Jalal Khan, son of Meeroo Khan, son of Boot Khan, son of Baloch Khan, son of Meeroo Khan, son of Baloch Khan, son of Mahommed Khan, son of Meeroo Khan, son of Mahommed Khan, son of Husen Khan, son of Isak Khan, son of Ahmad Khan, son of Gulo Khan, son of Pervez Khan, son of Kahloo Khan, son of Madil Khan, son of Noot Khan, son of Bazan Khan, son of Ayalee Khan, son of Zan Khan, son of Matan Khan, son of Sairan Khan, son of Rind Khan, son of Jalal Khan, son of Hareen Khan, son of Gul Kharaj, son of Jarkh Taj, son of Baloch Khan, son of Satookee, son of Ilm-i-Mardame, son of Badee Uzzuman, son of Ameer Humzah, son of Abdu Mutalib, son of Abdu Manaf, son of Abdul Hasham.

Isak Khan had two sons, Saheek and Husen Khan. Chakar Khan is the son of Saheek, he is the progenitor of the Chakaranees of Hindusthan.

The former Jalál Khan, had five sons: Rind, Latree, Hot, Ruraiee and Jahtoee.

Representative.

The Dehwars on taking possession of Kalat, held a council among themselves, and elected a representative, by name Rais Taj Mahommed, the eighth progenitor of the present Rais Khan Mahommed, and determined on putting him at the head of a deputation, to wait on the Rambaranee chiefs, who then resided at Mashkai, and invite one of them to rule over them at Kalat. The reason for making this choice was no doubt that they required a man of prowess; and where could they find one better to suit their purpose, than among the Brahoees, who had lately colonized, and who had gained every inch of the ground they possessed by the sword? and whose deeds under their chief Rambar, were probably then fresh in the minds of the Dehwars.

Deputation.

This Imaum Rambar it is said had eight sons: descended the Kambaranees. Kambar from whom

Kambar.

Ismail,	ditto	ditto	Ismail[illegible]ees.
Gurgeen,			Gurginadees.
Meroo,			Meerwanees.
Roden,			Rodeenees.
Eltaz,			Eltazais.
Ahmad,			Ahmadzais.

The Dehwar deputation waited on these brothers at Mashkai, and a consultation was held on the subject of the proposition, when the elder brothers agreed that they would spare Ahmad the youngest, on account of his not having, like them, lands, flocks, and families to bind him to his paternal soil, and as being the most likely not to usurp undue authority.

Ahmad, with a few of his own Brahoee followers, proceeded with the Dehwars back to Kalat, and held his first court under a mulberry tree, outside the fort, to the East, which was situated on *matee* land, (*matee* meaning river deposit,) and under this tree for several subsequent generations, the Ahmadzais held their court, when they had to discuss matters of unusual weight, affecting the general welfare.

Ahmad.

Before accepting however the Khanee of Kalat, Ahmad made the following stipulations with the Dehwars:—

Stipulations.

1st. He required one of the six canals to be given to him for his support; this canal is called Joe-i-Toot, or Joe Ghulaman.

2d. He required grass, stalls and pegs for his horses; wood for his kitchen; chobdars or macebearers for his court; couriers and runners to procure intelligence; guards on the gates; camel-men for marching.

3d. He required the fort to be repaired when necessary, and the snow to be swept off the houses and works in the winter.

4th. He required to be relieved from entertaining public guests, such as envoys and couriers from Candahar and elsewhere.

Like the Israelites of old, when once determined to have a king, none of the disadvantages urged by the prophet Samuel could deter them—so it seemed with the Dehwars, for they agreed to all these conditions, and continued faithfully to perform these services, with now and then some mitigation; for instance, as Kalat became peopled with foreigners, they were made to repair part of the works, and during the time of Meer Nasseer Khan, in consideration of the great influx of guests, he allowed the Dehwars 2,000 Kareembhanee rupees a-year; besides granting them some bunds or dams in Kuchee—these were however escheated by his successor Meer Mahmood Khan.

Tax.

Ahmad also made his brothers agree to give him from every flock one sheep, one rope, and one felt rug. This their descendants continued to do until the time of Meer Nasseer Khan, who remitted the tax.

Geneology.

Meer Meerab Khan is, I believe, the seventh in descent from Meer Ahmed, the progenitor of the Ahmedzais, and among these seven, are Meer Mehrab Khan-i-Kalan, Meer Kale Khan and Meer Samander.

Intimacy.

Among the eight brothers, the Ahmedzais, Eltazais, and Kambaranees amalgated together, and shared each other's joys and sorrows; that is, they intermarry and pay visits of condolence to each other on the death of a relation, and share in the payment of blood-money.

Of the intermediate Khans between Meer Ahmed and Meer Abdullah, Mehrab Khan's great-grandfather, I am in possession of little information more than the following. Meer Sumandur obtained the surname *sakhee*, or the generous, from his great liberality and hospitality.

Meer Kale Khan.

Nomryas.

It was first under Meer Kale Khan, that the Brahoees rose into importance, and formed any thing deserving to be called a separate independent state. He expelled the tribe of Soomrees or Nomryas from Tuhrab, Baghlana and Khuzdar, whence they took refuge in Lus, and gave the country to the Brahoees. He also made inroads to the north and north-west, and took tracts of country from the former inhabitants, whom I believe to have been Huzarahs. This latter tribe it is true, is now only to be found far North of Balochisthan. But there is evidence of their being once settled as far South as the district of Shawl, and this evidence is furnished by the Takatoo mountain, the word Takatoo being composed of *taka*, a wild goat, and *too*, answering in the Huzarah dialect to the Persian *dar*, and Hindu *wala;* and English *er*, as falcon, falconer; and *kutchlak*, caves.

Huzarahs.

I believe the Brahoees to have gained northern Balochisthan from the Huzarahs, and the southern part from the Nomryas, Jokyas and Jaths. This latter tribe once held part of Mukran; and I have more than once been inclined to suppose, that the name had some connection with the country Gedrosia. There is besides a small stream near Cutchee, known by the name of Jathro at the present day, and a tribe called Jattakees, from their inhabiting the Jattak hills in the Brahooick range.

Jaths.

It was under Meer Kale Khan, I should think, and not under Meer Ahmed, that the Brahoees were spread over the conquered country in the following order: the Eltazais were given Baghbana; the Meerwanees retained Mashkai and Kolwah; the Rodeenees and Gurginadees were settled in the south, and the Ismailanees in the north; while the Kumbaranees were spread over the country from Kech to Mustung, as their great numbers created apprehensions of a revolution.

Colonies.

As the power of Kale Khan increased, the Badechees of Shorowak and the Panees of Siwee courted his alliance, and it was during this ruler's government that Akhund Mullah Mahommad arrived at Kalat, having fled from Sheraz. He was a man of great talent, and his prepossessing manners and his foreign extraction, which rendered him free from localties and interests, induced the Brahoees and their Khan to offer him the office of wuzeer with the title of wakeel, as wuzeer was only applicable to the prime minister of a king. The descendants of this Mullah Mahomed say, that he was by descent a Sayad, but dropt the title on gaining temporary power.

Alliances.

Wakeel.

Divisions.

It was this man that first divided the Brahoees and their country into the two divisions of Sarawan and Jhalawan. Sarawan means "upper country," and is derived from the words *sar* and *abadnee ;* thus Sarabadanee, Sarabanee, Saraban (as Beaban,) Sarawan and Jhalawan signifies "low country," from the words *jhala* and *abadanee.*

Sarawan is applied to the country north of Kalat, and Jhalawan to that to the south, while Lus means, the "flat country."

At present, in time of war, the Brahoees assemble under three standards; viz. under the first, the Khan of Kalat and his own retainers; under the second, the troops of Sarawan under their immediate leaders; and under the third, the troops of Jhalawan.

Meer Abdulla.

Dera.

Nothing of importance is really preserved as having taken place between the time of Meer Kale Khan, and Meer Abdulla Khan, who was a bold, proud and enterprising man, and was constantly employed making forays; sometimes in the territories of Shah Mahmood Ghiljee of Candahar, as is shewn by the tomb of Sardar Khan's father being at Lylee Majnoon; sometimes in Sindh; and sometimes towards Derajat. The reason of his invading the latter country arose from the following accident. A Brahooee shepherd, grazing his flocks in the country dependent on Dera, one day allowed his sheep to stray into some cultivation, for which tresspass the former killed one of the sheep, and severely beat the shepherd. He came to Kalat to complain to Meer Abdulla, who sometime afterwards expressed to his nobles his determination of invading Dera. In vain did they try to dissuade him, urging the insignificance of the cause of the quarrel, and the expense of the trip; nothing could dissuade him, and he declared thus in reply: "That one Brahoee sheep nightly leaps in the bowels of Abdulla Khan and allows him no rest."

The foray was made and proved successful, several of the Dera villages were burnt to ashes, and Abdulla Khan's troops returned to Kalat, laden with plunder, and encumbered with captives.

Kaloras.

Some time after this, a quarrel broke out between Abdulla Khan and the Kalora chiefs of Scinde, on the subject of the district of Cutchee, to which the Brahoee herdsmen yearly emigrated with their flocks for the winter. During the quarrel, Abdulla Khan made several successful forays in the territory of the Kaloras; to resent one of which, Meer Johrab collected a force, and moved out against the Brahoee chief. The parties met and had a severe engagement, in which the Brahoees were defeated, Abdulla Khan was killed, and his corpse was never discovered. With him, fell on the Brahoee side, besides three hundred men of no note, Meer Zirk Zahree, the chief of Jhalawan, and the father of Mulla Mahommed Raisanee. Abdulla Khan, before his death, inflicted a severe wound on the forehead of Meer Johrab; and ever after, when the subject of a quarrel with the Bhahoees was started in durbar, Meer Johrab would exclaim, "Ah! Baloches, the blood from the wound Abdulla Khan inflicted, still trickles down the forehead of Johrab."

Death.

Johrab.

It is also said, that Meer Abdulla Khan made several forays in the district of Kech; but failed to take the fort of that name.

Kech.

Meer Abdulla Khan left three sons: Meer Muhabbut Khan, Meer Mahommed Nasseer Khan, and Meer Eltaz Khan. The elder of these succeeded his father.

Sons.

Meer Muhabbut Khan's first thought was to revenge the death of his father on the Scindians, and this thirst would never perhaps have been allayed, had not fortune, about this time, brought the Persian conqueror, Nadir Shah, to Candahar. Meer Muhabbut Khan, after a consultation with his nobles, determined to repair to the royal camp, which he joined at Lahore, in its progress to Hindusthan, and stated that the object of his ambition and visit, was to get revenge for the death of his father. Nadir Shah's answer was, "The blood of Abdulla Khan stains the forehead of Nadir, and please God I will seek it at the hands of those fish-eating Scindians."

Meer Muhabbut.

Nadir Shah.

Meer Muhabbat Khan accompanied the conqueror on his invasion of Hindusthan. When Nadir, on his return, arrived at the Indus, the Khan reminded him of his promise; Nadir immediately ordered the route to be changed in the direction of Scinde, on his arrival on the boundary of which, Mijan Noor Mahommed, the chief, fled to Umarkote, and the inhabitants in dread left their villages and fled to the hill. On Nadir's arrival

Mijan Noor Mahommed.

Umarkote.

Cutchee.

Murad-i-Ganjah.

at Hyderabad, he lost no time, but by making several forced marches, (fable says one,) succeeded in surprising the Scindian chief in Umarkote, who immediately surrendered, and on being asked by Nadir Shah whether it was true he had a well full of gold; replied, "Please your Majesty, I have seven; and have brought the keys of the whole." This answer pleased Nadir, who did not fine him, but brought him with the royal camp back to Cutchee; when he ordered him to be taken to the tents of Meer Muhabbat Khan, to be treated as the latter willed. The Brahoees, after some consultation, decided that Nadir Shah would be offended if the Scindian should be put to death; they therefore contented themselves with requiring, as the price of blood, the countries of Cutchee, Curachee and the Roors, and a lakh of rupees in ready money. An agreement to this effect having been concluded in the presence of Nadir Shah, Noor Mahommed was allowed to return to his capital. On Nadir Shah's arrival at Ganjabha, the Scindian governor, Murad Ganjah, entertained him for a week, and then was killed by his orders, at the secret request of the Sindh chief, who distrusted him. Nadir then set out for Candahar, via Sannee and Sohian, and the Bolan pass. Meer Muhabbat distributed some of the lands thus acquired to the families of those chiefs who had fallen with his father. For instance, he gave Gajan to the son of Meer Zirk, and Meer Rasheed Khan enjoys it at the present day, and Rahnakha to the Raisanees.

Meer Nasseer Khan.

Mulla Shahdad.

Meer Muhabbat Khan's younger brother, Meer Mahommed Nasseer Khan, was, with *Agha* Aly Badozye, and a few slaves, in constant attendance on Nadir Shah: and afterwards, on his successor Ahmed Shah. He was looked upon as a hostage; and it is said, that during one of the campaigns, he and his followers were at one time so destitute, that they extracted the half digested grains out of horse's litter to make bread of. Meer Muhabbut, jealous of his younger brother, did not furnish him with funds adequate to his support during the time of Meer Muhabbat Khan. Akhund Mulla Shahdad was wakeel, and his son Akhund Mulla Mahommed Haryat was appointed to reside at the court of Ahmed Shah.

One sultry day, when Meer Muhabbut Khan and Akhund Mulla

Shadad were out hunting together, the former asked the latter to give him a drink of water. Mulla Shahdad complied, but with a bad grace, as he regarded the request derogatory to him, and fearing lest the Khan, if not remonstrated with, would demand other menial services from him, wrote a letter to his son at Candahar, saying, I always thought you were *haizat* (alive,) but unless you can get Muhabbut Khan's affairs disarranged for me, I shall think you dead. Akhund Mulla Mahommed Haizat, on receiving this letter from his father, made use of the influence his patron the wuzeer Shah Wulee Khan had over Ahmed Shah, in getting Meer Muhabbut Khan summoned to court. His coming to court, however, is accounted for in the history of Ahmed Shah as follows: When that monarch was on his return from Amanabad in Guzerat, to Candahar, in the third year of his reign A. H. 1162, Muhabbut Khan Baloch came in and paid his respects, and was made chief of the whole of Balochisthan; soon after he began to commit acts of cruelty and tyranny; among which, the murder of Gilan-i-Kasee in Shawl, was the most glaring. This determined the king to fit out an expedition against him. The royal force was opposed at Mustung by a Baloch force under Raim Khan Shaheranee and Mulla Haizat, and gained a victory, making both the above prisoners. On this news reaching Muhabbut Khan at Kalat, he repaired to the royal camp, surrendered himself, and then, with the whole of his family, accompanied the king back to Candahar.

Insult out Hunting.

Mulla Haizat.

When he, Mulla Haizat, had effected this, he still openly paid most abject court to Muhabbut Khan, as his lawful chief; but secretly intrigued with the Beahnee chiefs in the Khan's train, and by the aid of presents put at his disposal by his patron the wuzeer, succeeded in estranging the Brahoees from Muhabbut, and transferring their allegiance to Nasseer Khan. For some time these intrigues were carried on secretly; at last the wukeel, throwing off the mask, got the younger brother declared Khan of Kalat and himself wakeel; and had Muhabbut Khan and a few of his confidential attendants put under surveillance, in which he died.

Supercession.

Meer Eltaz Khan went mad; and his frantic tricks often justly caused alarm. One day at Ganjabah, Meer Eltaz appeared before Nasser Khan, when alone, with a

Meer Eltaz.

drawn sword. The latter was a little lame, from the effects of a wound received in Persia, and generally had a long straight sword with him, on which he leant. In trying to ward off his brother's attack, he accidentally gave him a thrust, which proved his death-wound. Meer Nasseer Khan was greatly shocked at this calamity, and afterwards his mind took a serious turn, and he fitted out an expedition to Mecca to make atonement for his crime.

Meer Nasseer Khan.

When Meer Mahommed Nasseer Khan obtained the Khanship of Kalat, he was twenty-four years of age: and he ruled it is said fifty years. Mulla Mahommed Haizat, as may be supposed, became all-powerful; so much so, that Bibee Miriam, the Khan's mother, is said to have taken her son to him; and solemnly to have confided the lad to his care, saying, he was the controller of her own and her son's fate, as the latter owed his advancement entirely to him.

Meer Nasseer Khan's first care on gaining power, was to reward the companions of his confinement. He conferred the government of Bhag on Agha Aly Badozye. The office of darogah of Kalat, he gave to Mullah Fazul Mahommad Khanahzad. The sundookdaree, to Mulla Peer Mahommad. To Mulla Yaya, he gave the office of phahgasee, and made Mulla Peer Mahommad Kalaghzye, duzbegeer and darogah of Mustong, and Mulla Gudud, his nazir.

Mulla Haizat fixed upon the chiefs to be employed, and took care that they were of sober and modest habit, not likely to mislead the young Khan.

The first time that Nasser Khan is mentioned in the history of Ahmed Shah, is in the following passage:—

Ahmed Shah.

In A. H. 1171, being the 12th year of his reign, on the 11th Rujab, the king having received intelligence of Ghazee-ud-deen Khan of Alumgeer, and of Shahzada Timoor, ordered an army to assemble under Meer Nasseer Khan, the Baloch chief, and to march on Cabool. On the 12th Shaban, the king started, and after being detained fifteen days on the road from sickness, arrived at Cabool on the 7th Ramzan.

Rebellion.

Nasseer Khan after assembling his troops, looking on the hurry of the king, as arguing his fear of some powerful demonstration on the part of the Marathas, threw off his allegiance, and fortified himself in Shawl, and commenced foraying the neighbouring Badeechees, Tareens, and other Afghans. Sometime after in a skirmish with the Kakurs, Rustom Khan Baloch with several followers were killed. On this account, the whole of Balochisthan joined Meer Nasseer Khan; except Meer Jahanee and Jangal Khan; who were in consequence obliged to make good their retreat to Iskalkot, a place distant one fursakh from Kalat. Nasser Khan's force gradually increasing, reached at last the alarming amount of one lac.

On hearing this, the king determined on proceeding to Balochisthan in person. After seeing Shahzada Timoor, he left Cabool on the 23rd Zilkad, and passing Candahar, encamped on Thursday, 9th Mohurram, on a rising ground, half a fursakh to the north of Kalat, and commenced the investment: next day, Shah Wullee Khan was appointed to take up the investment on the west side; Barkhurdar Khan on the north; Shah Pasand Khan on the south; and Khan-i-Khanan on the east. Batteries were erected, and hostilities commenced. Many men were daily killed and wounded on either side, and Barkhurdar Khan was wounded by a matchlock bullet. At last, on Tuesday the 4th of Mohurrum, at noon, after a desperate and well sustained engagement, the Baloches gave in, and Nasseer Khan sent his mother and Mulla Haizat to sue for pardon, and soon after followed them himself. The king conferred on him a dress of honor, (at that time coarse satin, called *mushroo*,) and the chiefship of the whole of Balochisthan.

Siege of Kalat.

The cause, course, and issue of this campaign is however differently told by the Brahoees, in the following manner: Shah Wullee Khan, the all-powerful wuzeer of Ahmed Shah, either finding his influence declining, or taking offence at some act of the king's, instigated his partizan Nasseer Khan to rebel: and then persuaded the king to advance in person on Kalat; which place was unsuccessfully besieged for some time. At last the king authorized the wuzeer to enter into terms. The latter of course had no difficulty in inducing Nasseer Khan to come out, and surrender: which, it is said, he did, accompanied by a few followers, dressed in the rude manner of his country, with raw hide shoes, camel hair coats, and leathern bags on their backs, containing a few handfulls of parched wheat,

Other Version.

Siege.

Surrender.

and pointing them out to the king, asked, "What can your Majesty want of men whose clothing and food are such as you see?" *

Bibee Jan.

Ahmed Shah took Bibee Jan, the sister of Bahram Khan, for a wife for his son Timoor Shah, and her brother accompanied her, with the king, back to Cabool.

Treaty.

A treaty was concluded between Ahmed Shah and Meer Nasseer Khan, on the part of themselves and successors, to the following effect. :—

1st. The Brahoee chiefs are not to interfere in the internal feud of the Sadozyes, and are to be subservient to the reigning king.

2nd. Should an Ahmedzye Brahoee take refuge in the Dooranee country, the Saddozyes are not to support him against the Ahmedzye chief of Kalat; they are either to give him up to the latter, or employ him about their persons.

3rd. The Saddozyes are not to pursue any of their tribe who take refuge in the Brahoee territory.

The chiefs of the Dooranees and Brahoees exchanged a similar agreement; with the exception of Barkhurdar Khan, Achakzye, who bore the Brahoees an ill feeling, having, in the Persian campaign, been accidentally wounded by one of them.

Observance.

This 3rd article was insisted on being rigidly observed, as in the case of Shahzadah Humayoon who took refuge from Shah Zaman in 1793; and in the case of Shah Shuja, who fled before the Sirdars after his last attempt to regain his throne, and took refuge with Mehrab Khan in 1834.

Service.

Distinction

Nasseer Khan continued to furnish his quota of troops in the Saddozye campaigns; and it was latterly employed in garrisoning Cashmere. There are at the present day Baloch works in Cashmere, Peshawar, and Cabool. He received 500 dresses of honor from the royal *toshakhana*, headed the van of the army; and was entitled to beat drums three times a day, and wear two *jigahs*, or jewelled plumes, a privilege never granted to the Sindhians.

Meer Nasseer Khan distinguished himself in one of the king's Persian campaigns. The chief opposed to the Dooranees had a private understanding with the wuzeer Shah Wulee Khan, and the latter, on

Nasseer Khan joining the royal camp, warned him not to volunteer for any attack on the enemy. Ahmed Shah, in public durbar, on several occasions, called for volunteers: no one came forward; at last Nasseer Khan, unable longer to counterfeit the craven, volunteered with 1000 Jhalawan foot, and 1000 Sarawan horse for the attack; during the time it lasted, a false report was brought to Ahmed Shah, of the Khan's defeat! The former sent the news to his mother, Bibee Miriam, who was in the royal camp. This heroic woman made the following reply: "If you say he is dead, I will believe it. Meer Abdulla never approached me without ablution; and I have never given suck to Nasseer Khan without the same; and have never slept with my back to him, how then can he be defeated and alive." A second courier soon arrived, and contradicted the false report; the attack had been successful. Ahmed Shah pleased with the high feeling displayed by Bibee Miriam, conferred on her and her son, the district of Shawl; making a pun on the word. Nasseer Khan out of this district gave the water of Hanna to his patron Shah Walee Khan Bamezye, and it is held to the present day by his descendants.

Exploit.

Shawl.

Nasseer Khan again distinguished himself in Hindusthan, at Muttra, where he was wounded. On his return, Ahmed Shah conferred on him the districts of Harrand and Dajal, (properly Daoojal.) After this, Nasseer Khan did not campaign in person; he never paid his respects at the court of Timoor Shah: but sent Sultan Mahommed Murad, the hereditary Sultan, to represent him there.

Harrand, Dajal.

Nasseer Khan made several fruitless attempts to take Kech. He at length made a grand effort, and ordered the whole of his force to assemble in the spring at Khozdar.

When assembled, it is said by Meerza Deen Mahommed to have amounted to thirty thousand horse and foot. The siege of Kech was commenced on its arrival there, but it was beginning to be rather a prolonged one, when Nasseer Khan annoyed at the delay, ordered ladders to be prepared, and the place to be assaulted by escalade at all risks. The attack proved successful. The Zikarees, who defended the place, were either killed or taken prisoners, and the grave of their patron saints defiled. The bones having

Expedition to Kech.

been extracted, were burnt with horse litter. The Brahoee loss amounted to seven hundred. Nasseer Khan held the Meeree by means of his own dependants, but gave the town and district to the Lichkees.

Imam of Maskat.

During the time of Nasseer Khan, the Immam of Maskat took refuge at Kalat, on account of some convulsion in his own state; and received in grant for his support, half the revenue of the ports of Gwadar and Chobar.

Allegiance.

So strict in his allegiance to Ahmed Shah was Nasseer Khan, that he never failed in sending the usual yearly presents, consisting of horses, camels and slaves, not only to the king, but to his courtiers. He has moreover been heard to say, that should none be left of the Sadozye dynasty but a girl, and that girl a blind one, the Ahmedzyes ought to acknowledge her.

Taste.

Nasseer Khan had a great taste for learning, and invited learned men from all parts to his court. He conferred on them salaries and grants of land, and distributed them throughout his dominions to instruct his ignorant subjects; and never were subjects more in need of religious instruction: it may fairly be said, that they were only made thorough Musulmans of, in Nasseer Khan's time.

Anecdote.

An anecdote is related of a Brahoee, who when asked of what persuasion he was, replied, "The persuasion of the Great Khan." On the Khan's return from his Hindusthan campaigns, he made up his mind to introduce shaving of the head among his countrymen, that they might in no way resemble the Sikhs. It was with the greatest difficulty that he got even the people immediately about his court to allow of the innovation, although he set the example by shaving the heads of his own sons. The Brahoees, however, of the present day shew they have in some way profited by their Khan's admonitions, seeing they differ from the Baloches, and never indulge in intoxicating drugs.

Charity.

Meer Nasseer Khan distributed large sums in charity, besides 2,000 or 3,000 Rupees every Friday in alms. He yearly sent to Mecca, presents to the amount of 30,000 Rupees; and fed pilgrims *gratis*, from one end of his dominions to the other.

Respect.

In such veneration was Nasseer Khan held, and so proud was the Brahoee nation of him, that an anecdote is told; and the truth of it credited universally. That a Brahoee, on his return home from an interview with Nasseer Khan, would not for several days after open his lips to a soul, not even to the members of his own family. On his being pressed by his half-frightened friends to disclose the reason of his extraordinary silence, he sharply observed, "How can I speak to such dirt as you, with the same mouth that has been opened to address the Great Khan."

Reverence.

The Brahoees looked upon the descendants of Nasseer Khan as their spiritual as well as temporal chief, until the charm was partly broken by Mehrab Khan, by the number of cruel executions ordered by him: but even in his time, the wild Brahoees from the hills, were in the habit of kissing the threshold of the citadel gate.

Anecdote.

An anecdote is also told, that Nasseer Khan, during the early part of his government kept a tame tiger, which he used constantly to visit for the following reason, which he assigned in reply to a questioner: "Whenever I feel rebellious, I look at its eyes, and they remind me of Nadir Shah's, and I am immediately quieted and made loyal again." He also never lost his boyish dread of Mulla Haizat's admonitions. The son of the latter, Mulla Futteh Mahommed, after his father's death, was wukeel during twenty-four years of Nasseer Khan's reign.

Cession.

When Nasseer Khan was getting old, fancying his end approaching, he reflected that his sons were mere children, and foresaw that the Sindians, on his death, would wrench from them the port of Karachee and the Koorg; he therefore determined, contrary to the advice of many of his self-sufficient courtiers, voluntarily to cede the above places, in favour of their former owners, which he accordingly did by treaty, after several missions and deputations, had been interchanged.

Bahram Khan.

Pottinger mentions,* that Bahram Khan made his appearance in Balochisthan during the reign of Nasseer Khan, and created some disturbances: but being defeated at Koohak by the latter in an engagement, again retired to Cabool, to which place he had originally accompanied his sister Bibee Jan.

Family.

Nasseer Khan had nine wives and concubines; for many years none of his sons by them grew up, but all died at an early age. He had nine daughters; four of which he gave in marriage to the four sons of Meer Kamal Khan Eltazye; the eldest, by name Maee Zainab, commonly known as Maee Sahib, married Meer Sayad Khan. He gave his other daughters in marriage to the Gichkees and Meerwanees.

Sons.

When Meer Nasseer Khan was almost beginning to despair of male issue, Bibee Khudejah presented him with two sons: Mahmood Khan and Meer Mustafa Khan; and by another wife, Bibee Jattee, daughter of Kamal Khan, he had a third son, Mahommad Raheem Khan.

Death.

Meer Nasseer Khan's death took place at Ganjabah, about six months after Timoor Shah's, which happened on the 20th May 1793, and his young, but eldest son Mahmood, succeeded him at the early age of eight years.

Duranee History.

Mahmood Khan is twice mentioned in the Duranee history; once together with his brother Mustafa Khan as having in 1804 paid his respects to Shah Shuja at Bagh, when that monarch was on his way from Candahar to Sindh, and a second time as having in 1814, paid his respects to Shah Mahmood at the same place.

Bahram Khan.

Pottinger says, that in the early part of Mahmood's reign, Bahram Khan again made his appearance in Balochisthan, and the ministers of Mahmood Khan were obliged to cede to him the district of Cutchee, on condition of his not molesting the remaining territory; with this condition Bahram did not comply, but raised a large force and assumed a threatening attitude: the ministers of Mahmood in alarm, applied to Shah Zaman, who sent a chief to arrange matters, which becoming impossible, war was declared. After several minor engagements, the rivals had a general one, in which Bahram Khan was defeated, owing to the defection, during the engagement, of several chiefs and their contingents. He fled to Hyderabad, where the Ameers refused him refuge, for fear of the displeasure of Shah Zaman. He then set out for Bhawalpore, and died of fatigue on the road, at Tanda-i-Kalandar Shah.

Daee Beebo.

Mahmood's nurse, Daee Beebo, became a person of great note from her method of bringing up the young Khan. When Mahmood and Mustafa grew up, dissensions were sown between them. Maee Sahab, Ahmed Yar Khan, and the Eltazyes supported Mustafa Khan in Cutchee; while on Meer Mahmood's side, were Mulla Futteh Mahommad wukeel, naib Abdu Rahman Badozye, and Meyan Ruhulla Babee. Such was the dissension, that it spread to families; fathers and uncles would be on one side, and sons and nephews on the other. However, when Meer Mahmood, according to custom went to Cutchee for the winter, Meer Mustafa would pay him the compliment of coming to Peer Chatta to meet him.

Dissensions.

Meer Mahommad Raheem Khan had fifty horse, and was in the pay of his elder brother. He was a great drunkard, but a generous man and a bold soldier: and he nearly succeeded in putting an entire stop to highway robbery in Cutchee.

Mahommad Raheem.

Mustafa was a great tyrant, and his punishments were most cruel.

Mahmood, although addicted to gambling, drinking and more degrading vices; was both humane and indolent to a fault. It is reported of him, that after ordering a culprit to be placed in confinement, he would go in person at night, and release him. He was a man of great strength, and it is said could straighten a horse-shoe.

Mahmood, it is said, accompanied Shah Mahmood twice towards Herat; and that monarch and Shah Shuja to the Derajahs and Sinde.

Campaigns.

Myan Ruhulla being a man of great talent and influence among the Brahoees, was looked upon by Maee Sahab with great suspicion, and as a dangerous rival.

Myan Ruhulla.

She persuaded her colleague, Mustafa, to attempt the Myan's murder. They could not for several years however find an opportunity. At last one winter, when Meer Mahmood was on his way to Cutchee, on arriving at Nad, he heard that Mustafa had assembled a force to oppose his further advance. He immediately despatched a confidential slave, by name Hajee Barat to Mustafa, who succeeded in appeasing the latter, and Meer Mahmood advanced into Cutchee, and made Gundava (properly Gunjaba) his head quarters. It was at this place, on the eve of the Eed Kurban, when Mahmood was sleeping outside the town, that Hajee Ubdu Rahman Kamangar, muazin of the mosque of Nasseer Khan, and an accomplice of Mustafa's, came and informed his master, that Myan Ruhulla was asleep and alone. The Khan, thinking it a

Murder.

Confiscation.

Imprisonment.

favourable opportunity, and attended by Shahghasee Deen Mahommed, repaired unobserved to the Myan quarters, and finding him asleep, murdered him. They afterwards made an attempt to murder Mulla Futteh Mahammed wukeel, and naib Abder Rahman in their quarters, but failed. Mustafa Khan, when the unusual consternation produced by this event was still at its height, despatched, by the Nagour road to Kalat, Sultan Mahommed, Murad Mullazye, and Meer Allee, the nephews of darogah Gul Mahommed, with orders to confiscate the Myan's property, as well as that of the following Babee merchants, who were all imprisoned, viz Khaleefa Abdul Kareem; father of the present Faiz Ahmed, Mulla Alif, Bostan, and Myan Moorulla, brother of the deceased.

Release.

Meer Mustafa sometime after came to Kalat himself, and released the Babee merchants, having realized, it is said, nearly four lakhs of Rupees, from the confiscated property.

Relationship.

Noor Mahommed Khan Moosanee, father of the present Meer Boohir, had, on hearing of the death of Myan Ruhulla, taken his family to a place of safety, at Noghiana, for the sake of the relationship that existed between them. Myan Sibaghatulla, the son of Myan Ruhulla, having married a daughter of Noor Mahommed Khan's.

Meer Fakeer.

Execution.

Another of the events that marked the reign of Mahmood Khan happened as follows: Meer Fakeer, father of Reia Bezanjo rebelled. Meer Mahommed reported the subject to Shah Shuja, and as he, as an Amadzye, could not inflict the punishment of death, requested the king to depute one of his own nobles to sanction the adoption of extreme measures towards the rebel. Naib Gul Mahommed Populzye was accordingly despatched, and arrived at Kalat, and from that place accompanied Mahmood Khan to Khozdar, where Fakeer and forty of his followers were captured and slain. Meer Mehrab Khan, during the Barikzye usurpation, did not hesitate to put Brahoees to death, without any sanction but his own.

During Mahmood's time, Quettah was twice sacked by the Kakars.

Muskat.

An embassy from the Immam of Muskat came to Kalat during Mahmood's time, and never after.

Quarrels.

The two brothers Mustafa and Mahmood were continually quarrelling; but always made it up after a short time, until the following occurrence took place:—

Maee Sahab, Ahmed Yar Khan, Meer Eltaz and their party, determining to have a struggle for sole power, proposed to connect themselves by marriage with the Talpoor family of Sindh, at the head of which there were the four brothers, Ghulam Alee, Karam Alee, Murad Alee and Futteh Alee.

Intrigue.

Marriage.

Maee Sahab and Meer Ahmed Yar Khan set out for Sindh, and gave to Meer Karam Alee in marriage Bibee Fatimah, the sister of Ahmed Yar Khan. The Meer in return, gave as a settlement the district of Shahdadpoor and two thousand rupees, and gave Maee Sahab great hopes of support to her cause.

Disgust.

This ill-judged match disgusted Meer Mahmood, Mustafa Khan, and the whole of the Brahoees, and even the friends of Maee Sahab equally; the Talpoors being considered a very low tribe, as the following Baloch verse will shew:—

Verse.	*Translation.*
Kedds, Gabal Godhai Pachalo, Talpoor Bewakai Maree. Durust Ghulam-i-Chakare. Banadi Bashkathaga. Datk-Nazurth Hadaiya.	Kedds, Gabols, Gadhais, Pachalos, Talpoors and lawless Murees. All were slaves of Chakar, (Rind,) with Banadi (his daughter) as a dowry he gave, Hadaiya (his son-in-law) would not have them.

Deputation.

Betrothal.

Mustafa Khan, Akhund Tutteh Mahommed, and naib Abdu Rahman, were deputed to Candahar to interest the king in revenging this insult. They had already a friend at court in the wuzeer, Sher Mahommed Khan. They offered to conduct the king through the Bolan Pass, (an offer never before made) and to assist him in collecting the arrears of tribute. They also gave Meer Mahmood's daughter, Bibee Emnah, to the king's eldest son, the present prince, Timoor.

On Shah Shuja's arrival at Shikarpore, he devastated the country on this side the Indus, and compelled the Ameers, after a great deal of hesitation and evasion, to pay the sum of twenty-four lakhs of rupees, as arrears of tribute: three more lakhs being spent in fees and presents to the courtiers. The Talpoors grateful for no heavier penalty, vowed twelve thousand rupees worth of silver to adorn the doors of the shrine of Sal Shahbaz at Dehwar. The Talpoors then entered into a treaty with Mahmood Khan, and expelled Maee Sahab from their territory. The Khan then accompanied the king on his way to Dera and Peshawur as far as Dagal, and thence returned to Kalat.

Tribute.

Treaty.

Meer Mustafa Khan and Mahommed Raheem Khan were deadly enemies. Mustafa Khan resided at Bagh, and Maee Sahab at Kotdo, and the former was in the habit of going on weekly visits to the latter, with a few horse, for the purpose of hunting in the neighbourhood, at Futtehpoor. During one of these hunting excursions, Mahommed Raheem Khan happened to be hunting in the same neighbourhood, at Panjak. On hearing of the proximity of his brother and enemy, he abandoned the hunt, and proceeded with his few followers to attack his brother: an engagement took place. Mustafa Khan was killed, and Mahommed Raheem fled to Dajal, where naib Sadar was acting for Mustafa Khan; and after sacking this place he retired to Janpoor near Dera. Maee Sahab took the corpse of Meer Mustafa to Bagh, and built a splendid mausoleum over it. Mustafa Khan left one son, Sarfraz Khan, a daughter Bibee Ganjan, and two widows, Bibee Ganj-Khatoo, sister of Meerulla Khan; Raisanee, and Bibee Hazaree, daughter of Meer Hasal Khan Shahwanee. During these transactions, Meer Mahmood was at Kalat.

Hunting.

Death of Mustafa.

Relict.

Mahommed Raheem, not being able to rest at one place, was brought by his evil genius again to Panjak, and to the neighbourhood of Maee Sahab, who burned to revenge the death, not only of a brother, but it is whispered, of a lover. She stole upon him one day while asleep, attended only by a slave, Baloch, who was shampoing him, and her attendants immediately despatched him, after a short resistance. The corpse was brought to Gundava, and afterwards sent to Baghbana. He left no family.

Death of Mahommed Raheem.

Death of Mahmood.

Meer Mahmood had now nothing to fear: but this independence came too late, for disease was making great inroads on his constitution. He at last fell a victim to zabitus, a disease brought on by venereal excesses, while yet a young man, having reigned 24 years. He left three wives, one concubine, three sons, and one daughter. Meer Mahommed Mehrab Khan, Meer Mahommed Azam Khan and Bibee Emnah of one mother; Bibee Sakhee, a Shaeezye Mogul. The third son, Maddat Khan, of the concubine, died at an early age.

Relicts.

Death of Maee Sahab.

Maee Sahab died in the reign of Mehrab Khan, of a stroke of a hot wind, in the Moola Pass.

Mehrab Khan.

When Meer Mahommed Mehrab Khan succeeded his father, he had arrived at years of discretion.

Opposition.

At the time of Mahmood's death, Shahzadah Kamran was at Candahar, and Munsoor Khan was governor of Shikarpoor. Akhund Futteh Mahommed lost no time in repairing to the latter place, and in persuading the Khan to accompany him back to Kalat, where assisted by the Brahoee chiefs, he installed Mehrab Khan on the part of the king, chief of Kalat; notwithstanding the opposition of Maee Sahab, the Eltazyes, and Meer Ahmed Yar Khan, who wished to declare the latter.

Rebellion.

Peace.

When Mehrab Khan, after his installation left Cutchee, and was returning to Kalat, Maee Sahab took Ahmed Yar Khan, and retired with him to Shawl, the place of Ahmed Khan Magasee, and collected a force of Chandyas and other Brahoees. Mehrab Khan on the other hand, collected a force at Gunjaba, and encamped at Panjak. No engagement however took place, and matters were peaceably arranged by Akhund Futteh Mahommed and naib Abder Rehman. Maee Sahab and Ahmed Yar Khan accompanying the new Khan to Kalat, Abder Rahman was left behind as governor of Cutchee; and wukeel Futteh Mahammed had otherwise the sole direction and management of affairs. After some time, however, Mehrab Khan entrusted the management of affairs to his mother, Bibee Sahtee, and her manager again was Meer Abdul Kadir, son of naib Abder Rahman, who soon supplanted his father, and led Mehrab Khan into every kind of debauchery. Some of the Khan's slaves, such as Meero and Mubarak, made a point of praising

Abdul Kadir.

their patron to Mehrab Khan in private. About this time Dad Mahommed Umarzye Ghilzye came into notice*; he was one of the *peshkidmats* of Mehrab Khan, and kept the seal with which the daily order for rations was sealed. This man, in the time of Mahmood, was dog-keeper to the young Mehrab, but getting into a scrape about an intrigue with one of nurse Beebo's slave girls, fled, and took service with Hajee Barat. He was once employed in collecting the revenue of Dajal. Mulla Fakeer Mahommed, a *khanahzad*, was the manager of Kalat, and kept the dafturs; Darogah Gul Mahommed and Shahghassee were of no note.

Dad Mahommed.

Akhund Futteh Mahommed still continued to serve faithfully; although superceded and surrounded by enemies, the foremost of which was the Khan's mother. For fear of her, it is said, the wukeel was of[illegible] afraid to go to his house at night, and slept by the Khan.

Conspiracy.

Although Mulla Abdul Kadir used to interfere in the wukeel's province, he always desisted when complaints were made to the Khan. At last the following enemies of the wukeel conspired together and determined to attempt his ruin: they were Mullah Abdul Kadir, Meer Eltaz, Meerulla Khan Raisanee, and some Ghulams.

Meer Mubarick, the son of Mullah Futteh Mahommed, and Meer Kadir Bakhsh Zahree, chief of Jh[illegible]wan, his son-in-law, were both (unknown to each other) enamoured of one of Mullah Futteh Mahommed's slave girls.

The conclave therefore first made a disclosure to each party of the other's successful amour, and thus succeeded in making them deadly enemies. At last in the month of Ramzan, when Meer Mubarick was performing ablution in his own room, Kadir Bukhsh stole upon him, and killed him: and then fled to Bibee Lal Baiee Eltazye, widow of Meer Mahmood Khan, (his own mother being an Eltazye,) where he remained in concealment three days. These same chiefs, after Meer Mubarick's death, importuned the Khan to kill Kadir Bukhsh, to avenge the blood of Meer Mubarick. Their object was to involve Meer Futteh Mahommed, in a bloody feud with the Zahrees, and to deprive the Akhund of the powerful influence of such a son-in-law. Meer Kadir Bukhsh was accordingly killed, in the Meeree of Gundava, while

Death of Meer Mubarick.

Death of Kadir Bukhsh.

bathing, and his corpse was taken to Zahree, by Taj Mahommed Zahree, his cousin.

Akhund Futteh Mahommed, by the counsel of the Zahrees, and consent of the Khan, then set out for Candahar, to sue for revenge: Shazada Kamran appointed Sirdar Poordil Khan Barukzye to accompany the wukeel, and to carry out his views in respect to Abdul Kadir and Meer Eltaz. Wuzeer Futteh Khan was a friend of the Akhund's.

Poordil Khan.

On Kamran starting for Herat, Poordil Khan set out for Dadar; on arriving there, he suggested to the wukeel that they should commence destroying naib Abdu Rehman's property, but the former would not consent. They then proceeded to Gandava, and Poordil Khan proposed the seizure of Abdu Rahman: but the Akhund again refused his consent.

This wavering and repenting annoyed Poordil Khan, and caused him to accept the overture made to him at this time by naib Abdar Rahman, accompanied by a bribe of thirty thousand rupees, and no doubt the Akhund would soon have had cause to repent his lenience, had not, at this time the news arrived of wuzeer Futteh Khan being blinded. On receiving the intelligence, Poordil Khan immediately set out for Candahar, and the deaths of Mulla Futteh Mahommed's son and son-in-law remained both unavenged.

Bribery.

Wuzeer Futteh Khan.

Maee Sahab, Ahmed Yar Khan and Sirdar Khan Rind, again rebelled, and took up their quarters in Sawee; having gained over the Khajaks. Mehrab Khan collected a force, and marched against them. Maee Sahab stood a twenty day's siege, and then made a conditional surrender, and with Ahmed Yar Khan, and Sarfraz Khan, the son of Meer Mustafa, accompanied Mehrab Khan to Gundava. Meer Ahmed Yar Khan having first sent his wife and two sons to Sagan.

Rebellion.

Surrender.

Merab Khan tried for a long time to get Admed Yar Khan to send for his two sons; but his friends persuaded him not to trust Mehrab Khan. At last, unable longer to resist the latter's importunities, the sons were sent for, and the whole party left Cutchee for Kalat.

Mulla Abdul Kadir despatched one Dadulla Khan to Candahar, to Poordil Khan, whom naib Abdar Rahman had secured in his interest, by the thirty thousand rupees' bribe, and got him to address letters to Maee Sahab and Ahmed Yar Khan, in answer to supposed proposals made by them, to the effect, that "their letters had been received by Poordil Khan, who recommended them to pursue the course they had adopted, and promised that he would start with a force as soon as their plans were matured."

Plot.

These letters were shewn to Mehrab Khan as intercepted ones; and in proof of the treachery of Ahmed Yar Khan. Merhab being loathe to believe it; other letters were procured and shewn, the Khan believed them to be genuine, and Kulla Abdul Kadir, Meer Eesa Khan Mongul, Dad Mahommad Gilzye, and Meero Ghulam, did not hesitate to advise the Khan to do away with both Ahmed Yar Khan and Sarfraz Khan, who at last agreed to it. Accordingly in the month of Rujab, one day early in the morning, Meer Ahmed Yar Khan was summoned before Mehrab Khan, being at the time an invalid, and cut down in the presence. Meer Surfraz was then sent for, they found him reading the *koran*, which book he brought to the presence with him, and by it intreated Mehrab to spare his life. His intreaties were of no avail, he was slaughtered on the spot, Meer Eesa Khan striking the first blow. Mulla Raiee, Shahghasee Barfee, and fifteen others of the deceased's attendants were killed at the same time. Ahmed Yar's sons, Meer Shahnawaz and Meer Futteh Khan, with their mother were confined; and they remained under strict surveillance for near twenty years. These murders were committed at Gundaba: and Mehrab Khan returned to Kalat, leaving Mulla Abdul Kadir governor of Bagh.

Deaths of Ahmed Yar Khan and Surfraz Khan.

On the march, and in the absence of the above, Dad Mahommed and Meer Eltaz completely gained the confidence and trust of the Khan, who soon after married Bibee Magany, the daughter of Meer Eltaz; and made the father his manager, Dad Mahommed having in reality all the power.

Meer Eltaz.

Mulla Abdul Kadir, thus finding himself supplanted, appropriated to himself about a lakh of rupees of the Cutchee collections; and proceeded to Kahnak and joined Meerulla Kaisanee. Mehrab tried to coax him to Kalat, but Poordil Khan and the Kakers some time dissuaded him. At last his father, Abdu Rahman, wrote him a letter; and among other affecting appeals, begged him not to prove false to the shade of Nasseer Khan; unable to withstand these intreaties, he set out, and having reached Manyochar, sent and requested that a respectable man might be sent from Kalat to meet and reassure him. Kueen Khan Zahree and Mulla Futteh Mahommed Khanazad were deputed with secret instructions to murder him, which they did; the father, Abdu Rahman, being murdered at the same time at Kalat. The family property was confiscated, and some time afterwards, Meer Yar Mahommad Shaeezye Mongal removed the family to a place of safety at Wad.

Murder of Abdul Kadir and Abdu Rahman.

Death of Meer Eltaz.

During this time, the Baloches of Cutchee were committing great depredations; and when Mehrab Khan was on his way to that district, Meer Eltaz died, having been sahabkar, or manager, only one year.

Duranee History.

In the Duranee history, Mehrab Khan is only mentioned once as having paid his respects to Mahommed Azeem Khan Barukzye and Ayoob Shah in 1820, when on their way from Candahar to Shikarpore; at which latter place Shah Shuja was.

Dad Mahommed.

On the death of Meer Eltaz, Dad Mahommed became all-powerful, but he did not make a discreet use of his power; for he was in the habit of treating the Brahoee Sirdars with disrespect, deriding their appearance and peculiarities of manner in public durbar.

His assumption so disgusted the Sirdars, especially those of Sarawan, that they deputed Sayad Mahommed Shareef to Candahar, offering all to pay their respects to the chiefs of that province, if they would promise them their assistance.

Defection.

Sirdar Sher Dil Khan wanted to get Shikarpore from the Scindians: he therefore treated the Sayad with great distinction, and he was despatched with an agreement and a dress of honor. The whole of the Sarawan chiefs then repaired to Candahar, and received dresses of honor.

Deputation.

Mehrab Khan, in great alarm, despatched Myan Sibaghatulla to Candahar, to make a treaty with the chief Poordil Khan, and to persuade the Sarawan chiefs to return to their allegiance. At the time of his arrival, Sher Dil Khan had advanced two stages, as far as Daee, but was obliged to return, from sickness.

Treaty.

Terms.

A sham treaty was concluded, which provided for the removal of Dad Mahommed, and the appointment of Futteh Mahommed to be wukeel; Sayad Mahommed Shareef, to be naib of Dajal; Mahommed Khan Shahwanee, to be naib of Dadar; Misree Shaeezye Mongul to be naib of Shawl; Arif Khan Mambaranee to be naib of Mustung, and 60,000 rupees of the year A. H. 1234 to be paid, (nominally to defray the expences of dresses and entertainment to the Brahoees.) The Sarawan Brahoees required the Khan's brother Mahommed Azam, wukeel Mahommed Sideek, Meer Rasheed Zahree, and Meer Eesa Khan Shaeezye Mongul, to come to Candahar to coax them back to their allegiance. The Sirdars despatched Mulla Abdul Ghyas in company with the Sahahzadah back to Kalat. The latter commenced intriguing with Mahommed Sideek Khan, and the other enemies of the Khan. These comprised the whole of the Brahoee chiefs, with the exception of Wulee Mahommed Mongul and Ahmed Khan Magasee, who with one consent determined on killing Dad Mahommed, even should no other opportunity be afforded them than in the presence of the Khan.

Consultation.

Defection of the Wukeel.

A few nights after the return of Sibaghatulla to Kalat, Mehrab Khan sent for wukeel Futteh Mahommed, and requested him to proceed to Candahar instead of Mahommed Sideek, who was an enemy of his; to this proposal the Akhund did not agree, and Mehrab Khan slightly annoyed, said, "Then you had better put your hands and feet in henna, and I will go myself." The Akhund was either playing a double part, or was led away by the Eltazyes, Eesa Khan, Meer Booheer, Rusheed Khan. Mahommed Khan Rind to regard the Khan's allusion to the red dye, as a threat to kill him be—either the true reason, he certainly immediately joined and headed the malcontents.

Rebellion.

Towards the evening of the next day, the whole of the Brahoees openly rebelled, and drew up on the road to Iskalko of the Shahwanees. Mehrab Khan moved out, and encamped in front of them, with the Ghulams, or slaves, the Babees, and the town and suburb people, attended by Wulee Mahommed Mongul and Ahmed Khan Magasee. Myan Sibaghatulla with the Khan's consent brought his mother, and put her down between the confronting forces. This of course was a signal for a truce. Until midnight, the Sahabzada Ṣibaghatulla vainly endeavoured to reconcile the parties, and Mehrab Khan retired into the citadel: and the Sahabzada succeeded in getting his friend, the wukeel's family, out of the town.

Deputation.

Next day, the Sahabzadee Sayad Jamal Shah, Nazar Juma, Meer Jam Alee, and Meer Yakoob Khan Eltazye, were sent on a deputation to the rebels, with the following proposals; viz. that Dad Mahommad should be deposed and made over to them for execution, banishment, or pardon; that the Akhund should occupy his place; and that they should all receive their former jaghirs. To these terms the rebels would not agree, saying, they had no faith in the Khan's promises or oaths regarding Dad Mahommed. On the Khan's deputation returning, Meer Kamal Khan, Meer Rusheed Khan, and Meer Yakoob Khan remained behind, the former was the last; on nearing the walls of Kalat a chance shot was fired by one of Ahmed Khan Magasee's men, and Meer Rusheed Khan returned to the rebels on the pretence that the shot was fired at him.

Defections.

The rebels moved off for Soherab, and Mehrab Khan sent Jam Alee to try and make terms. He also remained in the rebel camp.

Embassy to Candahar.

The Khan at last in despair, despatched Hajee Barat, Meer Gul Mahommed Ghilzye, Deewan Khemchund, and Sibaghatulla to Candahar, with Mullah Ghyas, the Khan's mother, and the stipulated 60,000 rupees.

Death of Sher Dil.

On the night of the rebellion of the wukeel and the Jhalawan chiefs, Mulla Ghyas received intelligence of the death of Sirdar Sher Dil Khan at Candahar.

On the embassy arriving at Kahnak, the tribes of Sarawan assembled, and tried to prevent the Maee proceeding to Candahar. Maee Naz Khatoo, niece of the Khan's mother, and wife of Mahommed Khan Shahwanee interceded, and prevented the detention of the embassy.

Poor Dil Khan.

Poordil Khan, on hearing of the approach of the embassy, left Candahar and encamped at Daee, that it might be thought he was prepared to take severe notice of the delay made by Mehrab Khan, in sending the deputation according to treaty; at the first interview therefore, although Poor Dil Khan receiv-

Increase of Tribute.

ed Maee Sahab with great courtesy, the delay was severely censured; and the Khan insisted on the payment of three lakhs instead of 60,000 rupees. This being agreed to, Poordil Khan offered, before the payment of the money, to put a force at the disposal of Maee Sahab, to punish the refractory wukeel and rebels of Jhalawan. She however proposed returning to Candahar with the Khan, from which place, dresses of honour were immediately despatched for Mehrab Khan and Dad Mahommed.

Terms.

Reception.

On terms being made with Poordil Khan, Mehrab Khan again sent proposals to the rebels in Cutchee; and Mahommed Sidick Khan, Meer Rusheed Khan, and Meer Kamal Khan proceeded to Kalat, on it being promised that Dad Mahommed should be given up to them, and that their jaghirs should be restored; however, on their approaching Kalat, Mehrab Khan furnished Dad Mahommed with 1,000 ducats and sixty horses, and told him to take refuge in Noshky. From this place Dad Mahommed despatched his father, Sher Mahommed to Candahar, with an offer to come and pay his respects to the Sirdar, and he in person, immediately followed, and was received with great distinction.

Return of Embassy.

The deputation remained five months in Candahar, and started on its return in the winter, accompanied as far as Shorawàk by the Sirdar's son, Meer Afzal Khan, and the whole way by Juma Khan Burikzye. The Sarawan chiefs also returned to their country, and Sibaghatulla and Khemchund were detained as security for the payment of what remained of the three lakhs. Mehrab Khan would not see his mother for a month after her arrival at Kalat, pretending to be offended at her having agreed to the payment of the three lakhs, and Dad Mahommed remained at Giránee at the Khan's request.

Failure to Negotiation.

The Khan then sent his mother to Cutchee, to reconcile the rebels. They would not listen to terms, and Mahommed Sidick and Meer Rusheed Khan also left Kalat, and proceeded to Cutchee in disgust.

Surrender of Mehrab.

After the winter was over, and the spring harvest reaped in Cutchee, the rebels proceeded to Khozdar, and threatened to continue their contributions in the direction of Mech. Kehrab Khan seeing his overthrow approaching, proceeded with a few attendants to Khozdar, and threw himself on the mercy of his wukeel.

After reconciling the rebels by such degrading proceeding, Mehrab Khan sent for Dad Mahommed, reinstalled him, after giving him a dress of honor, and going through the mockery of sending him to the Akhund.

Treaty annulled.

Dajal sold.

Mehrab Khan according to the treaty with Poordil Khan, appointed the naibs of the latter's nomination; but soon after deposed them. This and the reinstallation of Dad Mahommed rendered the treaty with Candahar null and void. Sayad Mahommed Shareef, naib of Dajal, had already sold the district to nawab Bahawal Khan.

Meerulla Khan.

Murder of Meerulla.

The death of Meerulla Khan is one of the events that mark the reign of Mehrab Khan. It occurred in the following manner: He was a Raisanee by tribe, and son of Mulla Mahommed, the mother of Sarfraz Khan; Bibee Ganj Khatoo was his half sister, and the mother of Abdul Kadir, Bibee Sahto, was his niece. On this account he was an enemy of Dad Mahommed, who caused their deaths; and Dad Mahommed aware of this, continued to prejudice the Khan, who had now become completely his dupe, against him. At last Meerulla Khan was sent for to the Meeree, under pretence of his counsel being required, and there, in the presence of the Khan, was murdered. Yoosuf Khan and Meer Zungee Raisanees were killed near the mosque outside of the citadel, and Sakeer Mahommed was killed in his own house in the town. Mehrab Khan that night pitched his camp towards Mhozdar, preparatory to proceeding to Cutchee.

Defection of Sarawan.

Invasion.

Engagement.

These murders spread the greatest consternation through the country, and in the spring, the whole of the Sarawan chiefs again sought refuge and redress in Candahar. Mohundil Khan collected a force and marched for Balochisthan. He arrived at and ravaged Shawl, Seeree, and Pilingabad. Mehrab Khan, after great delay, collected an ill-organized force, and marched for Kustung. At Shireenab, the two advanced guards met, and an engagement ensued, in which the Brahoee troops suffered themselves to be defeated.

Mehrab Khan, discovering an extensive and dangerous defection among his troops, was forced to buy off the Candahar force for forty, thousand rupees in A. H. 1234, and to give Meerza Gul Mahommed, as security for the payment of the money in Candahar. Rohundil Khan having procured satisfaction for himself, returned to Candahar, leaving the Sarawan chiefs at the mercy of Mehrab Khan.

Tribute.

Dad Mahommed seeing his influence declining, and becoming daily more unpopular, determined to connect himself by marriage with the Brahoees. He first took the daughter of Rais Khan Mahommed Dehwar. He next proposed for the daughter of Meer Misree Shaeezye Mongul, but was refused. He then took the daughter of Essa Khan Shaeezye Mongul, and the daughter of Wadera Jan Mahommed Bangulzye for his brother Khan Mahommed. He also made overtures to get up a party of the following; viz. Meer Wallee, Mahommed Khan, Ghulamzye Mongul, Meer Fazal Khan Zagar Mongul, Ahmed Khan Magasee, and Meer Bijad Keerwanee of Kech, and at Candahar with Mama (Khuda Nazar Khan Ghilzye,) and through him with Sirdar Rahamdil Khan. The reason for his conciliating Meer Bijad, was to secure Kech as a place of refuge, in case of his being disgraced at court.

Dad Mahommed's Connections.

Place of Retreat.

Day by day Dad Mahommed became more powerful, till at last the Khan himself was not looked up to, and the former collected the revenue, and disbursed it as his own caprice dictated; he even proceeded so far, as to give the Khan insulting answers, and to mimick him, and to boast to his face that he had the power of deposing him. He was in the habit of withholding the household expences for months together, and the Khan dared not remonstrate; he sometimes would not rise, when Mehrab entered the durbar.

Dad Mahommed's Usurpation.

The Khan's eyes were at last opened, and he determined on ridding himself of Dad Mahommed, and broached the subject to naib Mahommed Hasan, Shahghasee Noor Mahommed, Mahommed Sideek wukeel, Abdul Kareem Khan Raisanee, and several others. The firmly rooted infatuation of the Khan was, however, so well known to them, that they would not believe him, when he told them he wished Dad Mahommed's death.

Exposure.

For a whole year he failed to convince them, till at last when the winter approached, and the time for the court moving to Cutchee arrived, the Khan as usual, requested Dad Mahommed that the funds necessary for the preparations should be produced. Dad Mahommed put the Khan off from day to day, (and it is said, that the tents remained pitched for two months,) and at last flatly refused the funds. Mehrab Khan no longer able to bear with this assumption, sent for Dad Mahommed to the Meeree, and high words were exchanged. Mehrab Khan rising and retiring, and Dad Mahommed doing the same, to the suite of rooms occupied by the Khan's mother, for the purpose of performing ablution before saying prayers.

Dad Mahommed's assumption.

Naib Mahommed Hassan and wukeel Mahommed Sideek, with others of their party, had some time before consented to attempt the life of Dad Mahommed, who was aware of their intentions, but doubted their daring.

As the latter was performing his ablutions as above mentioned, naib Mahommed Hassen stole stealthily behind him, with a drawn sword, and cut him down. Shahghassee Noor Mahommed following the example.

Death of Dad Mahommed.

When I first met naib Mahommed Hassan at Hustung, in June 1838, with Sayad Mahommed Shareef, the latter praised the bravery of the former, as displayed on the above occasion; and pointed to the identical sword with which the deed was done, and which hung by the naib's side, with great pride.

Boast.

Dad Mahommed's property, to the amount of from four to five lakhs, was confiscated; but it was thought that a great quantity had been concealed, and Mahommed Hassan was appointed naib, and Mahommed Sideek wukeel, with all the honors. The Khan however thought and acted for himself, kept his own seals, and had his accounts kept by a Hindoo, by name Deewan Bachamal.

Appointment.

When Shah Shuja was besieging Candahar in 1834, Meer Shahnawaz Khan, and Futteh Khan, made their escape from the Meeree of Kalat, and their flight was not known till next day at noon. On their arrival at Pishing, they met Sirdar Samandar Khan on his retreat from Candahar, where Shah

Escape of Shahnawaz and Futteh Khan.

Shuja had been defeated, and returned with him to his estate of Hanna in the district of Shawl. They then took refuge for a short time in the Kakar country, and then separated; Shahnawaz proceeding to Candahar, where Sirdar Kohun Dil Khan, at the recommendation of Mulla Nassoo Lodeen, for some time afforded him support; and Meer Futteh Khan taking refuge with Meer Rusheed Khan Zahreehere, after some time, having assembled a force, he moved down on Cutchee, and was there joined by his brother Shahnawaz from Candahar. Several engagements took place between them and the Khan's brother, Mahommed Azam Khan, with varying success, until they were completely defeated by the latter at Dadar, and obliged to proceed to their former retreats.

Opposition.

Mehrab then moved a force against Rasheed Khan, and demanded that his protegé, Futteh Khan, should be given up. This Rasheed Khan refused. At last, at the mediation of the Brahoees, Futteh Khan was given up to Meer Walee Mahommed and Raheem Khan, to keep. Mehrab Khan then tried to bribe them, to deliver up their charge to him; but found they had too much honor for him. For they not only refused thus to dishonor themselves, but assisted Futteh Khan in making his escape to the Sasolees, from which tribe he retreated to Sinde, and took protection with his aunt Bibee Fatimah at Hyderabad, where he got addicted to low pursuits and debauched habits, as did his brother Shanawoz, at Candahar, who on that account, was neglected by Kohundil Khan, and reduced to great distress.

Meer Futteh Khan.

Pursuits of the Brothers.

Shah Shuja on his defeat, retreated via Lash, Seistan and Shorawak. On his arrival at the latter place, the Sirdars became aware of his proximity, and fitted out a "chapao," under Raham Dil Khan, for his pursuit and capture; which latter was so nearly being effected, that before the rear of the king's baggage had left the ground at Mungochar, the advance of the pursuing party reached it, and succeeded in capturing some baggage ponies. The Shah, on his arrival at Kalat, sought the tent of Mehrab Khan, and threw himself on his protection. The Khan received him with great honor, and all the deference due from a vassal to his sovereign.

Shah Shuja.

Pursuit.

Escape.

On leaving Mehrab Khan, scarcely had his majesty reached his own suite of tents, when Jan Mahommed Khan Kuzzalbash arrived on the part of Sirdar Raham Dil Khan, to demand the person of the king.

Conduct of Mehrab.

His Majesty, in the greatest alarm, sent Mehrab Khan a golden hookah, and five hundred gold mohurs, by Kazee Mulla Hassan Peshawuree; but the Khan, contrary to the advice of menials, returned them; and then, contrary to the advice of his courtiers, told Jan Mahommed to tell Raham Dil Khan, "If he wanted his friendship, to refrain from his demand; as he was prepared to sacrifice his life, property, country, and tribe, in the service, or at the feet of his lawful king." On Jan Mahommed taking his leave, and after the king had halted for some time at Kalat, the Khan furnished him with respectable men to accompany him to Bagh. On his arrival at the latter place, he heard of the death of Samundar Khan at Siwee, and therefore proceeded without delay to Shikarpore.

Events of 1838.

But to proceed from these events to those of the year 1838. On the 15th January of that year, I arrived at Candahar on a mission to the Sirdars, the object of which was to detach them from an alliance they were on the point of entering into with Persia; and in which I found Mehrab Khan was prepared to join them, notwithstanding he had sent an embassy avowedly to consult with them on the method of relieving Herat.

Events of 1838.

In order to make known the Governor General's declaration, that the British Government acknowledged and respected all the different holders of power in Afghanistan, I addressed a letter direct to Mehrab Khan with the consent of Raham Dil Khan. Sometime elapsed before I received an answer, and I only heard, that Mehrab Khan was piqued at Raham Dil Khan being made privy to our correspondence. Notwithstanding this, I afterwards discovered, that the delay in receiving an answer to my letter was occasioned by the Khan writing from Kalat to Candahar, to consult the Sirdar, regarding the style of answer he ought to return. This shews, that the supremacy of Candahar was acknowledged by the Khan.

Events of 1838.

On it becoming necessary for Sir Alexander Burnes, in April 1838, to break off all intercourse with Ameer Dost Mahommed, and to proceed direct to Peshawur, I was ordered direct to Shikarpore by the Bolan route.

On my arrival at Shawl in June, the Bolan route being reported impassable by the Governor of Shawl, on account of the hot winds, and knowing that the Governor General when he originally organized our mission, intended it should visit Mehrab Khan on its return to Híndosthan, I determined on getting invited to Kalat, to wait till the end of the hot weather. Having procured the necessary invitation, I proceeded to Kalat, where I held constant intercourse with the Khan for three months.

Events of 1838.

Before I became aware of the intention of Government to restore Shah Shuja, he foresaw that it would take place, and became very anxious to conclude a treaty with the British Government, saying, he was favorable to the Shah's cause, not from choice, for the king had never since he left Kalat expressed his gratitude for his safety, which he owed, after Providence, to him, but from necessity; for the protection he had afforded to the fugitive Sadozye monarch had made deadly enemies to him, of the Burikzye faction, which now ruled Afghanisthan.

Whilst at Kalat, I constantly wrote to Government, pointing out the value of the Khan's friendship, in case an army advanced by the Bolan route; but although while at Kalat, I received intelligence of the intention of Government to restore Shah Shuja, yet, I was ordered to keep it a profound secret.

The hot weather having past, and having yet received no authority to remain at Kalat, I started for Shikarpore; on my arrival at Soherab, I received a letter authorizing me to make the Shah's restoration public, but containing no instructions to remain at Kalat. These however at last reached me some days after my arrival at Shikarpore; and I had scarcely completed my preparations to return to Kalat, when I received a letter from Sir Alexander Burnes, saying, he had been appointed envoy to Kalat, and requesting I would delay my departure. I joined Sir A. Burnes at Roree, and he became so taken up with commissariat arrangements, in which he required my assistance, that he delayed either proceeding himself, or deputing me until it was too late.

Events of 1839.

Treaties had been concluded with the Ameers of Sinde, and the Nawab of Bhawalpore, and Mehrab Khan was called upon to allow supplies to be laid in Cutchee, and to procure camels. He laid obstacles in the way of the former being done, and made excuses for not doing the latter; saying, a treaty should be made with him, as had been made with the Ameers of Sinde and the Nawab of Bhawulpoor, to both of whom he considered himself superior, as he had never been tributary, as they had, to the Sodozye kings. A treaty was refused, and after the march from Shikarpore of the army of the Indus, Sir A. Burnes proceeded to Kalat, to purchase supplies and bring Mehrab Khan to pay his respects to Shah Shuja at Shawl; both of which objects he failed to accomplish, and the districts of Shawl and Cutchee were declared forfeited by the Khan accordingly.

The army advanced on Candahar and Cabool, and Mehrab Khan having been convicted of annoying detachments frequenting the Bolan Pass, by means of the Brahoee and other tribes inhabiting the neighbourhood, his deposition was determined on; and the Bombay column, under General Wiltshire, on their return, took the fortress of Kalat by storm on the 13th November, 1839.

Deposition.

Just before the citadel was stormed, and he was killed, Mehrab Khan sent the following message, with a matchlock, to his son by darogah Moosa: "Tell my son that both myself and my wealth have past away and become sin-offerings for him; give him this matchlock, that has descended as an heir-loom from his forefathers. Tell him to keep it, and bear it on his shoulders; and he will one day be Khan of Kalat. Tell him not to be guided by the counsel of the Brahoees, and not prematurely to oppose Shahnawaz Khan."

Last message to his son.

Mehrab Khan, in his lifetime, gave two of his daughters in marriage to two sons of Meer Karam Khan Eltazye; and for his son, the young Nusseer Khan, he engaged the daughter of Meer Rusheed Khan Zahree.

Connecting by Marriage.

The following will shew that Mehrab Khan repented of the murderous policy he had pursued.

In durbar one day in August 1838, wishing to prove, if what I had heard of his cruel disposition was true, I remarked, that the Afghans and Baloches could only be ruled with a rod of iron. "I thought so too," replied he with a sigh, "and many a chief have I had butchered beneath this very window at which we are sitting; but I was wrong, and I have lived to know it."

Proceedings of the Asiatic Society.

Meeting of Wednesday Evening, 7th June, 1843.

The usual monthly Meeting was held at the Society's Rooms at half past 8 P. M., the Rt. Rev. the Lord Bishop in the chair.

The following gentlemen proposed at the former Meeting, were balloted for and declared duly elected :—

R. CUST, Esq. C. S. and J. E. L. BRANDRETH, Esq. C. S.

The usual communication was ordered to be made to them.

One new Member was also proposed; viz.

J. W. FULTON, Esq. Barrister at Law. Proposed by Major E. POTTINGER, seconded by Captain BROOME.

The following Books were presented, and purchased :—

Books received for the Meeting of the Asiatic Society, on the 7th June, 1843.

The Calcutta Literary Gleaner, May and June, 1843. Vol. ii, Nos. 3 and 4. Presented by the Editor.

The Calcutta Christian Observer, June, 1843, Vol. iv, No. 42. Presented by the Editor.

The Oriental Christian Spectator, second series, May 1843. Vol. iv, No. 5. Presented by the Editor.

Edinburgh New Philosophical Journal, by Professor Jameson. Edinburgh, 1842, Vol. xxxiii, No. 66. Presented by the Editor.

Journal of the Royal Geographical Society of London, 1842, Vol. xii, pt. i.

Proceedings of the Geological Society of London, 1842. Vol. iii, pt. ii, No. 87. Presented by the Society

Journal des Savants, September, 1842. Paris. Purchased.

The Chemical Gazette, or Journal of Practical Chemistry. London, Nov. 1842. No. 1. From the Editor

London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science. 3rd series. Vol. xxi, No. 138 and 139. From the Editor.

Observations sur la Peste du Levant, et sur la vertu specifique de l'Huile d'Olive, par J. G. de Hemso. Florence, 1841. Presented by the Author.

Hemso, Degli ultimi Progressi della Geografia. Milano, 1841 and 1842. Presented by the Author.

Pratt's Mechanical Philosophy, 2d edition. Cambridge, 1842. Presented by the Author.

Goodwyn's Memoir on the application of Asphaltic Mastic to Flooring, Roofing, and Hydraulic Works in India. Calcutta 1843. Presented by the Author.

Goodwyn's Memoir of an improved System of Suspension Bridges, on the principle adopted by Mr. Dredge. Calcutta, 1843. Presented by the Author.

Newbold's British Settlements in the Straits of Malacca. London, 1839. 8vo, 2 vols. Purchased.

Drawings of the Gates of Somnath and of the Tomb of Mahommed of Ghuzni were exhibited to the Society, before being sent for publication in the Journal.

Read the following letter from Dr. HÆBERLIN :—

H. PIDDINGTON, ESQ.
Sub-Secretary of the Asiatic Society.

MY DEAR SIR,—I have the pleasure to acknowledge the receipt of your favor of the 2nd instant, along with a letter of Mr. Koenig of Bonn, and one of Dr. Roer, the Librarian, respecting a selection of Books to be sent to Bonn, and to be received from thence.

I recollect having made a memorandum of the Sanscrit works proposed to be sent to Bonn for sale, as likewise what works published there should be requested. The lists were approved of, and I believe it was arranged between Mr. Torrens and myself, that I should communicate this to Mr. Koenig; unfortunately I had not kept a copy of the Memorandum, and after once or twice asking for it, it then appeared to have been mislaid by Mr. Torrens. My weak state of health prevented a more active share in this, as in every other measure of the Society at the time; and not being in possession of the lists as approved of, I put it aside, and as it often happens, forgot the business altogether.

This is the only apology I can offer for the omission on my part. Mr. Torrens must take some share of the blame, for having mislaid or lost the Memo.

I have often felt the want of a more ready communication between Germany and India, and have some months ago, (in the hope of establishing a regular channel of communication and exchange in Oriental publications,) made proposals to the principal publishers there on the very subject; and moreover, personal intercourse between an individual on the point of coming to Calcutta and the Booksellers of Leipsig, Berlin and Bonn, being now lost, as an individual member of the Society, I could wish that the subject should be allowed to remain, as it is at present.

The Society cannot conveniently undertake the duty of selling books for Booksellers; and the works printed in Calcutta could be despatched with greater regularity, and with more chance of meeting with a ready sale, if arranged by those who make it their particular business. This much, as to the proposal to interchange publications with Mr. Koenig.

But the subject, now to my best recollection first revived by Dr. Roer, and likewise mentioned by Mr. Koenig, demands a few words more.

1. It appears from Dr. Roer's letter, that the works sent by Mr. Koenig have been received, but never distributed. (By the bye, I venture to put in a claim for a copy of each.)

2. That no returns have been made. If the value of the Books presented by Mr. Koenig be at all considered (about Rs. 500,) he would be entitled to several copies of all our Sanscrit publications now on sale, and this is an additional reason, why for the present it might be better not to dispatch any Books to him for sale.

I think Mr. Koenig is entitled to, and I beg to propose accordingly:—

6. Copies of the Mahabharata, complete,
12. ,, ,, Harriwanso,
12. ,, ,, Raja Tarangini,
12. ,, ,, Naishada,

I thank you for the kind enquiries after my health. I am happy to say, that there is hope of its being restored on these hills, although at present I am still an invalid. If all be well, it is my intention during the approaching rainy season to leave Simla, and endeavor to cross the Himalaya, when I would have an opportunity of visiting the various places in which our late lamented Librarian, Mr. Csoma, lived in true Tibetan fashion. For myself, I do not mean to imitate him in that respect.

Should any thing occur of [illegible]rest to the Society, it will afford me great pleasure to put you in possession of it.

J. Hæberlin.

Simla, 15th May, 1843.

A descriptive list of the coins, lately received from the University of Christiana, with remarks, was presented by Dr. Roer, the Society's Librarian. The list is as follows :—

Descriptive list of the Coins, presented by the University of Christiana, by Dr. Roer.

I. Coins of the 12th Century, especially Norwegian.

A. Coins, bearing the inscription of a single letter.

1. The letter A, inscribed in two concentric circles. R.
2. The same, smaller. R. R.
3. The same with a point on both sides of the letter, and another below. R.
4. A similar one of smaller size. C.
5. The letter B, inscribed in two circles. C.
6. The same with a point to the right. R.
7. The same with a point on either side. R2.
8. A similar one, smaller.
9. B. with four points. C.
10. The letter G. R2.
11-12. Two similar ones.
13. The letter H, surrounded by four points, and the outer circle formed by globules. R4.
14. —— with a point below.
15. Similar.
16. The same letter with three points. C.
17. M, with a point above. R4.
18. N, with a stroke, crossing the middle line. R.
19. R, with a point to the right.
20. The same, with a point on either side. R2.
21. S, with a point on either side. C.
22. A similar one.
23. Similar, but the S reversed, and the outer circle consisting of globules.
24. The letter T in its antient shape, with a point behind. C.
25. X with globules in its extremes, and the outer circle also consisting of globules. C.
26. A similar one, with a small line affixed to its upper portion. R.

B. Coins, representing simple Crosses.

27. A Coin, bearing a simple cross, inscribed in two circles.
28. A similar one.
29. A small Cross, the arms terminating in globules. R4.
30. A Cross, with two points. C.
31. A similar one.
32. Another of larger size.
33. A Cross, a point in every angle.
34. A Cross, the foot of which is supported by two oblique lines. R2.
35. A similar one, arms terminating in globules.
36. Another.

C. Coins, representing Patriarchal Crosses.

37. A Patriarchal Cross, arms terminating in globules. R2.
38. A similar one, the foot supported by two oblique lines. C.
39-40. Two similar ones.

D. Coins of various types.

41. A Coin, having a spiral line inscribed in it. R3.
42-43. Two plain Circles, being concentric to an outer one, which consists of globules, the centre marked by a point. C.
44. A Star, composed of eight 2-horned rays.
45. Obv. A bearded Head.
46-51. Six Coins, not distinguishable.
52. Obv. A Building. R. Runic characters.

Frederick I. Emperor of the Germanic Empire. 1152-1190.

53. O. FREDREIMPR. The Emperor with a crown, seated; in the left holding out the globe of the empire, in the right a sword; on the left a star.
R. Roma caput mundi. A castle with gate and tower.

Hitolph, Archbishop of Cologne, 1076-79.

54. O. HIT ARTT PISCOP. The Archbishop seated, with two infula in his right.
R. Colonia. Pais mai. A Castle, with three towers and a gate.

Philip, Archbishop of Cologne.

55. The Archbishop seated, in the right the infula, and in the left a book.
R. Sancta Colonia.

II. *Norwegian Coins, previous to the accession of the Oldenburg dynasty.*

1. Ob. Olaw D. Gra. Archep. Nid. En.
R. Sanctus Olaw. This is a coin of Olai Lunge, late Archbishop of Norway.
2. A Coin of the Interregnum in Denmark of 1448.

III. *Coins of Danish Kings of the Oldenburg dynasty.*

CHRISTIAN I. 1448-81.

3. Christi. .. D. G. An. R. surmounted by a crown.

JOHN. 1481-1513.

4. Jas. D. G. R. Dani. In the centre of two circles the letter R. surmounted by a crown.
5. The same.

FREDERIC I. 1523-59.

6. Fred...Dan.

FREDERIC II. 1559-1588.

7. Frider..s. II. D. G. Danie. Rev. Rex Norvegie Vanda. Gotor. in the centre Skillingk, Danske, 1630.

8. The same.

9. The same ; two Shillings.

CHRISTIAN IV. 1588-1648.

10. Christianus IV. D. G. Danie. Three lions running. Rev. Red. Electus. Norv. Vand. Goto. II. Schillinck Daniske 95.

11. Christianus IV. D. G. Dan. A lion with the forelegs raised. Rev. Rex. N v. Van. Goto II. Shillinck Dansk, 1644.

12. IIII. Shillink Dansk. In the centre D. surmounted by a crown. R. Iustus Iudex, 1644.

13. Legend the same as the former. The bust of the King bearded and encircled by a Crown. 4 Schilling 1630.

14.-45. Thirty-two two Shilling Pieces of the same devices and legends as Nos. 10-13, of the respective years, 1594, 1595, 1603, 1601 (2), 1608 (2), 1611, 1613, 1618 (3), 1624, 1625, 1626, 1627 (2), 1629, 1643, 1644 (2), 1646, 1648 (3), 1648 (3), 1645 (3). The year of three Coins not discernible.

46-50. Five 1-Shilling Pieces of the years 1614, 1624, 1625, 1644. The year of one coin not distinct.

51. Chris. 4 D. G. D. C4, surmounted by a crown, below 16. Rev. Monos cic. 30. A figure, standing on a globe.

FREDERIC III. 1648-70.

52. Frederic III. D. G. Dan. The armorial signs of Denmark. 1648. Rev. Rex. Nor. Van. Goto. II. Skillinck Dansk.

53. Legend the same. 1649. A Lion raised on his hind-legs.

54. Dominus Providebit . surmounted by a crown, 1665. One Shilling Piece.

55. Frederic 3 D. G. Daniae Rex. Bust of the King, bearded and crowned. Rev. Moneta Nova Gluckstad, XVI. E. Richs. Dal. 1665.

56-119. Sixty-four 2-Shilling Pieces with similar legends and types as those in Nos. 52-54, of the years, 1648 (2), 1649 (2), 1650 (5), 1651 (5), 1652, 1653 (2), 1654 (4), 1656 (2), 1657 (2), 1658 (2), 1659, 1660 (4), 1661 (2), 1665 (7), 1666 (5), 1567 (9), 1668 (4), 1669 (2), 1676 (3).

120-30. Eleven 1-Shilling Pieces with similar legends and types from the years 51-61, successively.

131-145. Fifteen more of the years 1661 (4), 1662 (3), 1663, 1664 (3), 1667, 1668, and two with illegible years.

145-50. Six 4-Shilling Pieces, with similar legends and types of the years 1665 (3), 1667 (2), 1669.

151. As 55. 1668.

152. Fred. IIII. Dei Grat. Head of the King with part of the bust. Rev. Dan. Nor. Von. Got. A crown 8 S. D. M. A. 1700.

153. Two F. and two 4 joined together. A Crown, above Dominus mihi adjutor.

Rev. XII. Skilling Danske 1719. The armorial signs of Denmark. G. L. W.

154-155. Similar to 152 of the years 1703-1704.

156-58. Similar to 153 of the years 1721 (2), 1724.

CHRISTIAN VI. 1730-1746.

159. Two C. joined to two 6, surmounted by a crown. D. G. Rex Dan. Norv. Va. Go. R. 24 Skillinch. Danske. A lion standing, 1734.

160-161. Two similar ones, 1737.

162. Ob. the same. R. XII. Skil. Danske for de Amerca Insuler. A ship under weigh. 1740. C. W.

163-64. Fr. Two 2-Shilling Pieces, 1745.

165-66. Two 1-Shilling Pieces.

The remarks were ordered to be published in the Journal, and the thanks of the Society were voted to Dr. ROER for his communication.

The Secretary stated, that a Supplement to the Monograph on Cuckoos, lately published in the Journal, had been handed to him by Mr. BLYTH, and sent to the Printer.

The Secretary reported the following distribution of the extra copies of Captain EASTWICK's Scinde Vocabulary, which is printed in No. 133 of the Journal; viz.

50 Copies presented to the Government of Bengal.
24 Copies presented to the Government of Bombay.
24 Copies presented to Captain Eastwick.
1 Copy presented to Major Leech.
24 Copies presented to the Political Secretariat of the Government of India.
50 Copies for sale at Bombay.
75 Copies for sale at Calcutta.

A letter from Messrs. GOULD, with copies of the published numbers of their splendid work, the Birds of Australia, was read, and it was voted, that the Society subscribe for a copy.

Read the following letter from Mr. BLYTH :—

H. TORRENS, ESQ. *Secretary, Asiatic Society.*

SIR,—So much extra work, (that is, in extra hours,) has been performed during the last *two months* by our Taxidermists, that I must again recommend that the Society acknowledge their assiduity by a suitable largess—20 rupees or so divided between them. Let me also warmly recommend that a proposal of Nicholas, (who appears in straitened circumstances, having an often sick wife and child to provide for,) be considered, to the effect that for a small increase of pay he would be glad to devote two or three hours more daily to his work as Taxidermist. It was promised to him on a former occasion, that, if he continued to give satisfaction his salary should be further increased, and without at all wishing to disparage the services of our senior Taxidermist M. Bouchez, the inequality of remuneration between him and Nicholas is certainly at present excessive, the one receiving 50, and the other but 20 rupees monthly.

7th June, 1843.

I have the honor, to be, Sir,
Yours most respectfully,
ED. BLYTH.

Extracts from a letter from Major Troyer were read, stating that up to its date, 4th April, he had not succeeded in recovering the lost consignment of the Mahabharata from London. See Proceedings of January 1843, Vol. XII, p. 65, but that some enquiry still remained to be made.

Read the following letters :—

No. 61 of 1843.

From T. R. Davidson, Esq. *Offig. Sec. to Govt. of India, to* H. Piddington, Esq. *Acting Sec. to the Asiatic Society.*

Political Department.

Sir,—I am directed by His Honor the President in Council to transmit to you, the accompanying copy of a Report by Dr. W. Jamieson, on the Geology, Zoology, &c. of the Punjab and of a part of Affghanistan.

I have the honor, to be, Sir,
Your most obedient humble servant,
T. R. Davidson,
Offg. Secy. to the Govt. of India.

Fort William, 26th April, 1843.

No. 559.

From the Sec. to Govt. of India with the Govr. General, to H. Piddington, Esq. *Secretary Asiatic Society, Calcutta.*

Foreign Department, *Secret.*

Sir,—I am desired by the Governor General to transmit to you, a Report by Captain Graham on the resources of Shoa, with a view that if the Society deems fit, it may be published in their Journal. You will be pleased to return the document to the Officiating Secretary to Government, at the Presidency, when done with.

I have the honor, to be, Sir,
Your most obedient servant,
J. Thomason,
Secretary to the Govt. of India,
With the Governor General.

Agra, the 13th May, 1843.

H. Piddington, Esq. *Offg. Secy. to the Asiatic Society.*

Ambala, 26th April, 1843.

Sir,—I some time ago drew out a few Notes on Moorcroft's Travels in Ladakh, and on Gerard's Account of Kunáwar, which my immediate superior, Mr. Clerk, thought sufficiently interesting to be sent to the Governor General, and which His Lordship, I have been gratified to hear, has communicated to the Asiatic Society. In some Supplementary Observations on Capt. Hutton's Tour to the Spitti Valley, I make mention of the Gangbal or Snow Fish, and as I have since had a portion of the skin of one sent to me by the Raja of Bisséhir, I have thought that I could not do better than transmit it to you, although it may be that I regard as new what is well known.

I have accordingly dispatched it to-day by Banghy to your address, and as I have not sent any letter with it, I have written in the corner of the packet the word "Gangbal" in addition to my name.

I have the honour, to be, Sir,
Your very obedient servant,
J. D. Cunningham.

June 5th, 1843.

Ramree, Arracan, 7th May, 1843.

Dear Sir,—I obtained the enclosed Coin (I imagine) from some of the inhabitants of the Island of Chedooba, who found it with other similar ones in digging, on the sea-shore, a well. I beg to know if it is gold, and if a Coin, what country it belongs to, and of what date?

The Mugs say it is a Coin of some of the Eastern Islands, deposited on Chedooba by the wreck of some boat.

I shall feel obliged by your giving me the above information, and returning me the Coin.

Yours truly,

D. Williams.

A reply had been addressed to Captain Williams, requesting him to secure one Coin of each sort or more for the Society. The Coin is of very thin gold, and probably an Ancient Hindoo one, though of unknown type. Mr. Piddington presented an Electro-type matrix from it, which he had secured for the Society before returning the Coin to Captain Williams.

The following Memorandum of a work published by Captain Newbold was read, and a copy which had been procured for inspection was ordered to be purchased.

Published by John Murray, Albemarle Street, in 2 Vols. 8vo. with Map and Plans. Price 15 Rs.

A History of the British Settlements in the Straits of Malacca—Penang, Malacca and Singapore.

Comprising a History of the Malayan States on the Peninsula of Malacca, their Government, Religion, Trade, Political and Commercial Relations, Laws, Population, Revenue, Natural Products, Physical Aspect, Geology, &c. By James Newbold, &c. Madras Army.

N. B.—As this work was not published with any view to pecuniary profit, only copies sufficient to cover the expences of publication have been printed.

Read Report of the Curator of Museum of Economic Geology, for the month of May.

Report of the Curator Museum of Economic Geology, for the month of May.

Museum of Economic Geology.—Our active correspondent, Captain Newbold, Assistant Commissioner of Kurnool, forwards to us several specimens of Minerals, to which I shall advert in a future report. We have also received from him, six specimens of the Tobacco soils of that station, and two of the Sugar soils.

Captain Goodwyn, B. E. has at my request obliged me with another specimen of the Asphalte of Pyrimont, (see Proceedings of January) for our Mineralogical Collection, and I may mention here, that on the reverse of bricks from the ruins of Babylon, in our Museum, the bituminous cement of which is still adhering to them, I have found it to present as nearly as possible the same chemical characters!

Geological and Mineralogical Department.—At my solicitation, Mr. Howe, at Kyook Phyoo, has been good enough to send us an additional box of specimens from the Mud Volcano, the eruption from which is adverted to in my report of February. Mr. Howe states that—

"The Volcano is still in a bubbling boiling state, the orifice not larger than a tea cup, and there is a" hot slimy fluid to be dipped up at the surface, but no vapour or noise is emitted, and it is otherwise quiet."

These specimens will I hope enable us to furnish a complete set of them to several Societies, to whom I doubt not they will be objects of much interest, as they will be enabled to compare them with the products of the Mud Volcanos of South America.

Captain Boys of the 6th Light Cavalry, Assistant to the Commissioner of Kemaoon, who has already obliged us with a paper on the genus Paussus, and promised us a selection from his geological collections, being about to proceed on a trip towards some of the Thibet Passes, I have been able to be of some little assistance to him in the way of procuring books, instruments, &c., and by permission of the Secretary I have informed him, that the Society will be happy to repay any extra expenses he may incur in taking on men and *jooboos*, for the purpose of sending *back* to the nearest inhabited spots, as he proceeds on his journey, the specimens he may collect, requesting his attention particularly to the deposits of various organic remains at great heights, the formations in which these are found, and the glacial phœnomena of which so many traces, and upon such a stupendous scale, must exist in those mountains and the lower ranges. By this arrangement we trust to obtain, with a very trifling expence, not only an assortment of specimens for our Museum, but some for exchange with our friends at home;[*] for in India the great defect in these matters is, that amongst our few observers, with their unsettled residences and passing visits, together with the unfrequented localities of many of our remarkable Geological and Mineralogical specimens, we obtain perhaps *one* set of specimens, and it is a quarter of a century at least, before the spot is again visited by an European, who can select another set! As an instance; it is now 18 years since Captain Franklin visited the Diamond Mines of Punna in Bundlecund, and his specimens have even disappeared from our Museum. It may be 10 years more before another geologist visits the spot. A few sets of specimens from thence would be invaluable as presents at home.

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[*] The Curator here read the following extract of a letter received that day by dawk from Captain Boyes, as follows:—

H. Piddington, Esq.

Almorah, May 27, 1843.

Your last three notes have been duly received, and I now return you my best thanks for the kindness with which you have troubled yourself on my account. Your last note, respecting the sculls will meet with every attention I can give it, but I much fear that this proposed trip will not afford many specimens, as the natives either burn or consign them to the rapids. The route I have determined on is to go from this to Melum, across the Jowahir Pass, and if possible, return by Neetee. I have been induced to this in a great measure by your former letter, which seems to shew, that Captain Weller's Journal refers to some interesting points regarding the ammonite deposit, and I also wish more attentively to observe the country about Neetee and Mullairee. Last year when at the latter place, which [illegible] some 16 miles on this side the Pass, I obtained a few specimens of Fossil Shell, (either Terebratulæ or Pecten,) which I would wish more thoroughly to investigate, as I believe it is an opinion that no Fossils occur on this side the range. The mountain behind Melum, both on its Southern, S. E. and S. W. faces, is compossed of Limestone, containing myriads of the above-mentioned Fossils, but the rock is so hard (even to giving fire with the steel) and the shells so closely wedged, that a stricter search and more time than I then had (I was only one day there) is necessary to produce a worthy result. The crags forming the ridge of the mountain (called Choping-ka-danda,) are formed of Clay Slate, which appears to have been upraised through the shelly deposit. The strata of the latter, as far as I could observe, are horizontal. I send by Dawk Bhangy the specimens I there collected, and hope that this trip will produce something more acceptable. Dr. Jameson informs me, that the specimens are all of them too small for practical purposes, which rather surprised me, as most of them are at least half a pound in weight; this fault I shall avoid in future, but having to carry them about myself, I could not well take larger specimens, which I shall now be enabled to do from the Society's assistance of the joboos or coolies as may be. I should have been delighted to have gone to the Gung-tung Pass, but the distance from this precludes the possibility; there are however many interesting points in my present route, any one of which will amply repay the trouble incurred."

The Rev. Mr. Pratt has obliged us again with a number of Geological specimens obtained at various parts on his recent voyage; many of which are valuable in themselves, or will fill up blanks in our Geological series.

I observed accidentally on passing the Kidderpore Bridge, a large lump of chalk amongst the ballast heaped by the side of the Nullah. Upon examination, this proved to be a piece of the upper chalk with flints! and as a specimen it fills up a blank in our collection. On another rock I found a number of oysters, (Ostrea gregarea,) which are also I think new to the Museum. It is of course impossible to ascertain the locality of these specimens, but they are always useful for reference.

I have to report in this department the dispatch of a box, containing a duplicate series (160 specimens) of Captain Pemberton's Geological Collection on his Mission into Bootan. Being a Government Collection, it may be right to place on record here, the letter addressed by me to our Secretary with the box.

H. TORRENS, ESQ. *Secretary of the Asiatic Society.*

SIR,—In obedience to the desire expressed by the Honorable the Court of Directors, I beg to forward for transmission from the Geological Department of the Society, a duplicate set of Geological Specimens, 160 in number, collected on Captain Pemberton's Mission to Bootan.

2. These specimens it may be right to explain, though collected in 1837-38, were sent to the Museum in 1841, by Captain Pemberton's executor, General McLeod, B. E., and there recognised as being this series; but no catalogue or note accompanied them.

3. After much search for many months, it was discovered that the numbers referred to Capt. Pemberton's private Note Book, from which Mrs. Pemberton having copied the localities and other details, the Memorandum was sent out to the Society from England by General McLeod. Had we earlier possessed this note, no delay would have occurred in arranging and forwarding the collection.

4. A Catalogue accompanies, and a duplicate of it is enclosed in the box.

5. I beg to suggest, that a copy of this letter be forwarded with your letter of advice.

I have the honour to be, &c.

Asiatic Society's Rooms,
5th June, 1843.

H. PIDDINGTON,
Sub-Secretary of the Asiatic Society,
and Curator Museum Economic Geology of India.

The reference to the Gungtung Pass in the above is in relation to M. Jacquemont's well known mystery (or hoax) respecting some discovery to be made there. See Journal, Vol. V p. 190, which I had pointed out to Captain Boyes.—H. P.

JOURNAL

OF THE

ASIATIC SOCIETY.

Report of a Visit to the Pakchan River, and of some Tin localities in the southern portion of the Tenasserim Provinces. By Captain G. B. Tremenheere, *F. G. S. Executive Engineer, Tenasserim Provinces. With a Map and Section of the Peninsula.*

1. The boundary between our provinces and the Siamese territory at the south and western extremity of Tenasserim, has never been distinctly defined.

After a correspondence with the Court of Bangkok, it had been arranged that an agent on their part should meet Mr. Commissioner Blundell on the Pakchan river on the 1st of March, where evidence was to be heard on both sides, and the question finally settled. The departure of the Commissioner from Maulmain was unavoidably delayed till the 4th of March. At Mr. Blundell's request, I formed one of his party in the H. C. Steamer *Hoogly*, and touching at Amherst and Mergui, entered the Pakchan river on the 10th of March.

2. The entrance is about two miles wide, affording ample room and deep water for the admission of ships of the largest burthen. The numerous islands which range along either shore of this fine river, and the bold hilly country beyond, afford views which would be thought picturesque in any country. For the first ten miles it is very slightly contracted in breadth, and has little of the character of a river, but of a capacious inlet of the sea. To this distance we carried not less than four fathom water, but, for the most part six and seven. After proceeding thus far, we turned into the Malewan river, and anchored at about

one and half mile in a N. W. direction, for the purpose of communicating with the British Settlement of that name. The next day, proceeding eight miles higher up the main river, we anchored in three fathoms abreast the confluence of the great Kaman river, beyond which the channel being much contracted by sand banks, the Steamer could not proceed. From thence we moved in boats; and arrived at Pakchan in eight hours; the distance as surveyed by Captain R. Ross, commanding the *Hoogly*, being thirty miles. The river narrows gradually, and from the great Kaman, passes through level country; approaching Pakchan, hills again appear, and it becomes very tortuous, at which spot it is about 50 yards broad, with a rise and fall of tide of eight feet at the springs.

3. The governor of Pakchan, a Chinaman, informed Mr. Blundell, that the chief of Peechapooree, who had been deputed by the Siam government to meet him, had arrived at Pakchan punctually on the 1st of March; after waiting ten days, he had retired to Chimpohun, on the plain of the east side of the peninsula. It was therefore determined that Dr. Richardson, Assistant to the Commissioner, should go to the chief and invite his return to the projected conference: accordingly, Dr. Richardson and myself, with a few of our own followers, commenced our journey on foot a little after 5 A. M., the prospect of crossing the peninsula being an object of peculiar interest.

Following generally the course of a small stream called the Kraa, which joins the main river at Pakchan, we proceeded by a good and clear road of ten to fifteen feet wide through the jungle towards the Kraa Pass, distant three miles in a N. E. direction. The road here turns to the South of East and the Pass, which is not intricate, leads for some distance along the bed of the rivulet, and terminates to the South-East at six and five-sixth miles from Pakchan. Here the greatest altitude is attained between the valley of the Pakchan and the alluvial plains on the east side of the peninsula, for soon after, at eight hours and seven minutes A.M., we came upon the waters of the Chimpohun, running in an easterly direction towards the gulf of Siam, the country then begins to slope gradually to the East; at eight hours thirty-seven minutes A. M., we halted two hours for refreshment by the side of the Chimpohun, at a spot where there are three or four houses, having the name of Bantapakchan. We here observed a canoe, which can be floated to

Chimpohun during the rains, and if necessary, to the gulf itself. From thence the road continues good. It crosses the Chimpohun very frequently, besides many dry ravines which communicate with it; the banks of these, where crossed by the road have not more than thirty or thirty-five feet of abrupt declivity, the rest of the ground being very regular, and partaking of the general slope of the country. At 3 P. M., having walked seventeen and half miles, we fell in with an elephant, and inducing the driver to take us on, were relieved from further personal exertion. The first eight miles of the eastern slope of the Pass have the greatest fall, after which the descent is easy till we reach the alluvial plain of Chimpohun. Nearing this plain, at 5 P. M., we observed the influence of the tide in the river, and at 5-30 reached Chimpohun. The plain is covered with rice fields, bearing signs of abundant crops as far as could be observed on all sides, and is bounded by a range of hills bending in a curved direction to the South-East. Some of these near the plain have much the same isolated and abrupt character, as the limestone hills near Maulmain. After half an hour's delay, the headman forwarded us on fresh elephants to the camp of the chief, which we found at Tasapaow, three and half miles distant further East, and reached it at 8. P. M., the entire distance between Pakchan and Tasapaow, being nearly twenty-eight miles.

4.* We were here hospitably treated, and visited the chief early the following morning. After a slight dinner, Dr. Richardson succeeded in inducing him to return and confer with Mr. Blundell, whom he expressed himself anxious to meet. His encampment was on the right bank of the Chimpohun, where the river is about 180 yards broad, running through a level country over a sandy bed, free from obstructions, and with a rise and fall of tide of about six feet at the springs. The depth of water at 8 A. M. on the 13th of March, was six feet with a rising tide. It communicates directly with the gulf of Siam, from which, by the best information, we were distant five miles. A sea-going boat of about thirty tons was under a shed at this spot; but junks trading on the Siam coast do not pass beyond Tayang, a town four miles East of Tasapaow, and within a mile of the sea. Time would not admit of our going to the coast, as Mr. Blundell and the rest of the party were expecting our speedy return to Pakchan. The distance of Tasapaow from the sea, as above given, may I think be relied on, having been obtained from one of our own people who had formerly resided some time at Chimpohun. The protraction of my route also, with these five miles added, makes the East coast of the peninsula correspond, within one mile short, with its longitude by Horsburgh's chart. The distance therefore between Pakchan and the coast of the gulf of Siam is thirty-two miles, and the entire breadth of the peninsula at this point from the Bay of Bengal to the gulf, is as nearly as possible sixty miles.

5. After receiving the chief's return visit, elephants were provided to take us back to Pakchan; we started at 11 A. M. and halted for the night on the Chimpohun river at a shed about half way, named Tacumlae, and reached Pakchan the next day, 14th March, at 2 P. M. On the way back, I paid particular attention to the inclination of the country, with the view of forming a probable estimate of the elevation of the top of the Kraa Pass, where the head waters of the Kraa and Chimpohun rise, and I am of opinion, that the difference of level between that point and the plains at Chimpohun and Pakchan does not exceed 450 feet. Along the entire route between these two places, or twenty-three miles, running water was crossed thirty-two times, besides which, there are numerous dry nullahs before mentioned, which would be occasionally unfordable during the rains.

The road is never more than 100 feet above the bed of the river-course; it has an easy slope, and except at the crossings of the streams and nullahs, is now passable by guns; but no part of the road would during the dry season present any difficulty to the passage of an army.

6. Some speculations having appeared lately in the columns of the *Moulmain Chronicle*, on the practicability of carrying a canal across the Isthmus of Kraa, whereby ships might pass by a short route from India to China, instead of round the Malayan peninsula, I am induced to offer some observations, under the idea, that enquiries on the subject might probably be made at some future period.

From the tidal waters of the Pakchan flowing westward to the Bay of Bengal to those of the Chimpohun running eastward to the Gulf of Siam, I paid as much attention to the slopes and facilities for such a work as the nature of our journey allowed, and while no work of this description, where the physical difficulties are not absolutely insurmountable, ought perhaps to be pronounced impracticable, I have no hesitation in saying, that the scheme alluded to, is not in my opinion reasonably practicable.

On a rough estimate, I assume 450 feet as the greatest rise of ground between the two seas, and if we suppose the line of road to be 100 feet above the level of the bed of the water-courses of the Pass as they now exist, and deduct that from the above, it will leave 350 feet of excavation, chiefly in solid rock, to be effected at the head of the Pass, to which the depth of the ship channel would remain to be added.

As no ships could come higher up than the second anchorage of the Hoogly, or 25 miles in a direct line below Pakchan, the length of the canal would be increased by that distance, as well, in all probability, by the five miles beyond Tasapaow, as the rivers on that side of the Peninsula are known to be generally obstructed by bars of sand. Both the Kraa and Chimpohun rivers are very small streams at this season, running over rocky beds, and no supply of fresh water could, I think, be depended on from either, to feed such a canal, or that would be sufficient at any period of the year to supply the loss by absorption and evaporation. An approximate section of the ground is given on the accompanying plan, by which it will appear, that the probable cutting for such a canal, supposing its width 100 feet and of rectangular form, would be on the lowest calculation as follows:—

	Length.	*Breadth.*	*Depth.*	*Cubic Feet.*
From the Great Kawan River to Pakchan, ...	25 miles +	100 feet +	60 feet	870,000,000
From Pakchan to top of Kraa Pass, ...	$6\frac{5}{6}$ Do. +	100 Do. +	380 ÷ 2 =	685,520,000
From top of Pass to a spring marked in the Map, ...	16 Do. +	100 Do. +	380 ÷ 2 =	1,605,120,000
From the spring to Tasapaow, ...	5 Do. +	100 Do. +	180 =	264,000,000
From Tasapaow to the Gulf, ...	5 Do. +	100 Do. +	50 =	132,000,000
				3,556,640,000 { Solid feet of Excavation,

which, supposing that one man excavated during the entire work twenty cubic feet per day, and placed it where it was eventually to remain, and that one man's labor is there worth one rupee per day, would cost eighteen millions sterling.

7. Having remained at Pakchan during the 15th, for the purpose of the conference between the Siam Chief and Mr. Blundell, which took place on the morning of that day, we left the place the same evening, and rejoined the steamer again in eight hours. On the 16th, we

dropped down to our first anchorage, and on the same day visited the settlement of Malewan, which is on [illegible] branch of the Malewan about seven miles from its junction with the Pakchan. On the flood tide, junks of twenty or thirty tons can approach it; but at low tide there is no water to float the smallest canoe.

Malewan is but a recent settlement, and is particularly interesting, as being the only spot in these Provinces, where people have located themselves for the purpose of collecting tin. Although inhabited only for three years, there are already about 100 Chinese, 160 Malays, and about as many Siamese on the spot, more than 500 in all, including women and children. The surface of the country is pleasingly undulated, having a range of high hills between it and the sea. It possesses a rich moist soil, highly favourable to cultivation. The sugar cane shewn to us was of large size, and the areca tree, which in other parts of Tenasserim does not fruit till the 7th or 8th year, was seen here in flower after being three years in the ground. Two heavy falls of rain occurred while we were in this neighbourhood, and it would appear that its climate, more resembling that of Penang than any other part of our coast, would be well adapted, with the advantages of soil before mentioned, to the cultivation of nutmegs, spices, &c.

8. The Siamese and Malays are occupied principally in clearing for cultivation, and the Chinese are the chief adventurers in tin. The head Chinaman has established a store of provisions, consisting of every description of supply suited to the wants of the people about him, which he exchanges for tin ore, to those who may be industrious enough to collect it. Of this he had three or four tons on hand, from which sample A was taken. It is precisely similar to specimens I have forwarded on other occasions, and consists of pure peroxide of tin, collected by washing from the beds of streams in that neighbourhood.

On the 17th, I proceeded to a spot which one of the Chinamen had fixed on for a stream work, and reached it after walking between four and five miles.

The stream is one of the tributaries of the Malewan, marked No. 1 in the plan. Their principal work was not on the main stream, the course of which we had followed to reach the place, but on a small branch, which then afforded water scarcely sufficient to clean and exhibit a sample of the ore dug out with its sand and gravels before me.

This tin soil consisted of fine grey sand, mixed with quartz and granite pebbles, and was taken from near the surface of the bed of the water-course; it was not here more than eighteen inches deep, for as soon as the iron pick, with which it was loosened, penetrated to the clay, they seemed assured there was no tin below. The subsoil all around is said to contain tin, the deposit of former periods; and in some of their excavations, I observed soil precisely similar to that from which tin was washed on the lower levels. From its occurrence so near the surface in existing water-courses, which from their slope must become rapids during the rains, I infer that tin must be washed down from its source in considerable quantities every year.

The trough used for washing is circular, about eighteen inches in diameter and six inches deep, in which the sand and gravel is piled and washed, as before described, by a rotatory motion of the hand Specimens of the soil, and of the produce of separate washings are sent, numbered 1. During the dry season, little or nothing is done in collecting tin, but preparations only are made by trenching for considerable distances along the brow, or down the slopes of the adjacent hill, to obtain a fall of water during the rains. Under this the soil is collected, when the sand and pebbles are washed away, leaving the tin behind. Some of these trenches were from ten to twelve feet deep, and one of about three feet deep was nearly 200 yards in length. The fall so obtained saves the laborious process of washing with the trough in a stooping position, which is irksome to the men, but which women and children are said to perform with greater ease.

9. The next day I went again in a Northerly direction five miles, to visit three other localities, where other parties of Chinamen were engaged in similar works. At each of these places, there were from eight to twelve men employed in preparations for work during the ensuing rains. The surface soil is a rich red mould, the subsoil of the same grey sand and quartz pebbles as before, with abundance of tin intermixed, and rests upon granite.

The three spots visited this day have all the same character; from the first the separate washings were less productive than from the other two; but at these the quantity produced each time surprised me, and drew forth an exclamation of pleasure from the Chinamen engaged in collecting it for my inspection. The greatest quantity of clean ore obtained from one trough full of soil was 2078 grs., while the average was 1235 and 855 grs. The time occupied in each washing is from five to six minutes.

They stated, that in the rains, one man would earn four rupees worth of tin per day. These small parties appeared full of energy and determination to make the most of the advantages before them. About their houses, situated in small clearances in the midst of the jungle, there was an appearance of comfort and cleanliness not often seen on this coast, while their good nature and hospitality is unbounded.

10. The prevailing rock around them is granite, which is seen in situ in several places, cropping out of the soil from the beds of the stream, and in the cuttings before mentioned, where I observed it was a good deal decomposed. I do not find on examination, that in any instance the tin exists interspersed in the granite, but have every reason to confirm the opinion expressed in former reports, of its occurrence in the fissures and cavities of the rock from which it has been removed by disintegration of the enclosing substance. None of the Chinamen have, as far as I could ascertain, penetrated to the principal granite hills, but are content with what they find in the streams at a distance from the source whence the tin proceeds. There doubtless it exists in veins or *vugs*, or cavities, in abundance. The metal being found so near the surface of the present water-courses, the causes which have distributed a rich layer of tin soil in and around them, are assuredly still in action. Fresh veins or cavities loaded with the crystalized mineral are thus becoming constantly exposed to the decomposing effects of the weather, and are therefore to be found by mining at very moderate depths. The stream works described will form, perhaps for long periods, profitable employment to Chinese adventurers, whose system of collection is that to which the Siamese and Malays are accustomed. These productive streams are, however, but the index of what is to be found elsewhere, and if these localities ever attract the European capitalist, of whose notice I believe them to be well worthy, the proper sphere for the scientific miner should be in the hills themselves. There, if a little cautious investigation were previously made by practised men in search of a spot for mining operations, the use of the common horse whim, or the most ordinary draining apparatus, would, in my opinion, in the course of a very short time discover veins, which

it would be very profitable to follow out with more complete and expensive apparatus.

11. After my return from the tin works we left Malewan, and proceeding next day down the river, anchored at the mouth of the Rhenong river, for the purpose of visiting the Siamese tin works and smelting establishment on the Southern or Siamese side of the Pakchan. This tidal creek is nearly dry at low water, but small junks come up with the flood: it narrows considerably at three miles from its entrance, and is very circuitous; after three hours' pull in a boat in a S. E. direction, we reached the settlement of Rhenong.

The leading people here are Chinese, who have a high fenced enclosure about eighty yards square, one side of which is occupied by the smelting establishment. A few women were employed in sifting tin ore* through a fine sieve. Only one furnace, or large crucible about four feet high, of conical form and three feet diameter at top, formed of baked clay, appeared to be in use, this was well worn, and a new one was there ready to replace it. One pounding or stamping machine, with a tilting bar worked by the foot, the Chinese bellows, and heaps of charcoal, were all the apparatus visible. No tin is collected except during the rains, and the village did not contain more than fifty families in all.

The duty said to be paid to Siam by the Chinaman is six tons of smelted tin per annum, for which he enjoys an entire monopoly. The collectors of the ore are paid a nominal price of two dollars for eighteen viss of ore; but as the payment is made by small ingots of tin, the only currency in use, the actual value received by workmen according to the present selling price of the metal, is eight rupees per hundred viss of ore: the same quantity being at Mergui worth forty rupees. It appeared from the information we were able to collect of the reported arrivals of junks at Rhenong for cargoes of tin, that not more than from sixty to seventy tons are produced per annum. The spot itself having a bold range of granite hills near, with level rice ground between it and the stream, has a very pleasing appearance. A few women were engaged in collecting tin ore in a clear stream running over granite boulders, within a few minutes walk of the place, and the produce of several separate washings from the trough was taken and noted, the result of which, compared to those of Malewan, &c. will be found below.* Their principal stream works are a day's journey distant towards the hills, which we could not visit.

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* Specimen B.

12. With the falling tide we rejoined the steamer, and soon after stood between the islands to the Northward towards Bokpyen, one of our own settlements, and visited some of the islands on our way. The most remarkable of these are the bird's nest rocks, of which we inspected two, the Turrets and the Elephants; they consist of fine picturesque masses of limestone rock, which stand boldly up, and present a perpendicular wall to the sea, with deep water all round them. The edible nests of the small Martin, so much prized in China, as to sell sometimes for more than their weight in silver, are found on the sides of chimney-like cavities, which extend from the summit of the rock more than 200 feet above the sea, having a small cavernous opening, with room enough only to admit a boat at low water.

13. Bokpyen, which is marked in Captain Lloyd's Chart, though not included in the sketch herewith, is a neat and flourishing village, containing about 98 houses, or 400 inhabitants in all. They are chiefly of Malay extraction, and occupied in the cultivation of rice, the collection of rattans, fishing, &c. The Bokpyen river produces tin, and during the Siamese rule, large tin works are said to have existed. A channel for running water, the remains of which are now traceable, is reported to have extended over a considerable distance by aqueducts and cuttings, which is presumptive evidence of the abundance of tin in the neighbouring hills. Little or none is collected now; one man brought us a very good sample in a bamboo; from this he said he had sifted the fine grained tin, which he had either sold or smelted, and, not knowing what to do with the large pieces, had kept them.† These were lumps of pure peroxide of tin, measuring from ½ to ¾ of an inch, without any quartz or earthy matter adhering, and this he called "refuse tin," which was of no use to him: a fair example of the ignorance with which tin working is conducted in these localities.

14. The following is a comparative statement of the produce of separate washings from a trough full of tin soil, each washing occupying

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* Specimen No 5

† Specimen C.

five minutes in filling from the bed of the stream and cleaning, as exhibited by the specimens sent and numbered:—

Locality Malewan, No. 1.	*Weight of separate washings in Grains Troy.*	*[illegible]verage of [illegible]h in Grains Troy.*	*Average of the whole in Grains Troy.*
	326		
	404		
	* 320		
	* 327		
	177		
	157		
	163		
	143	252	
Malewan, No. 2,	* 297		
	93		
	* 448		
	120		
	177		
	472		
	180	555	
Malewan, No. 3,	534		
	* 1499		
	* 1100		
	2078		
	1024		
	1173	1235	
Malewan, No. 4,	1076		
	503		
	* 1142		
	* 698	855	650
Rehnong, No. 5,	1081		
	371		
	* 991		
	* 653		
	542		
	555	699	699
Bokpyen, No. 6,	373		
	263		
	319		
	227		
	464		
	1011		
	* 381	434	434

A good specimen collected at Bokpyen, by two men in about twenty minutes, weighed 2040 grains. The specimens marked by an asterisk are sent in duplicate with this report.

G. B. Tremenheere, *Captain,*
Maulmain, *8th April,* 184[illegible] *Executive Engineer,*
Tenasserim Division.

Memoir on the application of Asphaltic Mastic, to Flooring, Roofing, and Hydraulic works in India. By Captain Goodwyn, *Engineers. With a plate.*

[This valuable memoir has already been lithographed, in which form many of our readers may have perhaps seen it; but its importance in all points of view is so great, that we have not hesitated to request permission from its talented author to insert it in the Journal.—Eds.]

At no period probably did there exist such an union of essential qualities in the means of constructing as at present. Allusion is here made to the value of the material employed, and the art of working and disposing it, so that in all classes of erections, whether private or public, there is an addition to personal comfort and convenience, combined with permanency of structure at an economical original outlay, estimated with reference to the least possible expence in subsequent maintenance.

The following memoir, in connection with others having relation to the improvements of the age, is drawn up with a view of introducing a most valuable material to general notice, one worthy the patronage of the Government, as well as the attention of the merchant, the planter, and all connected with building of every description. A material which has been extensively used with the most complete success on the continent for some years, and lately equally so in England. The excellent qualities and varieties in the mode of its application have received the approbation of the heads of our Engineer Corps now at home, Generals McLeod and Tickell, and Colonels Hutchinson and Colvin, in consequence of whose opinions I brought it to the notice of the Court, and was by the Directors permitted to bring some to Calcutta to be submitted to experiment. This is sufficient authority for my advocating its adoption, and constitutes a guarantee for its future success in India. I will here slightly anticipate the subject by noticing the result of an experiment which I undertook, to prove the efficiency of the substance to resist great heat, lest any sceptic should stop short of a full investigation of its merits, under an idea, that its component parts being bitumen and pitch, it would not answer in India.

A section of prepared flooring in a wooden frame 12″+6″ with a surface of 3-8″ of mastic was placed in a large oven (used for reducing the asphalte to powder) with a thermometer which directly rose to 230°, and though kept in for six hours, it presented a surface at the end of that time quite free from grease, proving that the pitch, the proportion of which is small, was not drawn out by the great heat, the extent of which I could not ascertain, as the thermometer tube broke shortly after insertion. A very few minutes after being spread in a fluid state, it again resumes its original density, which is such, that at 100° Fahrenheit, it resists all impressions from ordinary force. How frail and perishable are the floors and terraces of ordinary construction? In many situations unable to resist the wear and tear to which they are exposed from a variety of causes, such as the friction of stores and other heavy articles in magazines and store rooms, the dragging to and fro of boxes, cots and musquets in Barracks, &c. &c., whilst public as well as private property suffers considerably from the facility of access to white ants and damp through the slightest crevices in floors. Who is not aware of the rapid increase of the smallest hole in a terrace floor, and of the difficulty of efficient repair from the want of combination between the new and old material? It must surely then be no small matter of consideration, the employment of a material which offers a remedy for these evils, and affords a means of putting a stop to the constantly recurring heavy outlay on repairs.

It is well known, that the use of a bituminous cement was common in ancient structures, and history informs us, that the walls of Babylon, that wonder of the world, were cemented with hot bitumen.* In the destruction of some remains of fortifications, supposed to be of Roman erection near Pyrimont about 45 years ago, so great was the tenacity of the wo[illegible] that it was not pulled down without the aid of gunpowder, which circumstance led to an important discovery; it was observed that the cement resembled the asphaltic rock of Pyrimont, about five miles North of Seyssel at the foot of the Eastern side of mount Jura, on the right bank of the Rhone in the department de L'Ain. Several applications of the substance were immediately made, and the experiments on its properties as a cement for building masonry and keeping out damp succeeded entirely, since which, the working of the material has become of great importance. In the immediate vicinity of the asphalte is obtained a peculiar kind of mineral pitch, which mixed in certain proportions with the asphalte, forms the mastic, the subject of this memoir. Mr. Claridge, an English gentleman, has taken out a patent for it in England, and is most successfully bringing it into general use under the sanction of the Commissioners of woods and forests.

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* The Museum of the Society contains four bricks from Babylon, presented by Mr. Rich, and marked with the arrow-headed characters. On the reverse of these the bituminous cement is yet partially adhering, and upon examination, its chemical characters were found closely to correspond with those of Captain Goodwyn's Asphaltic Mastic.—Eds.

The surface of the ground in the locality of its discovery is covered by a molasse, consisting of silicious gravel and bitumen intercepted by deep ravines. A mass of calcareous asphalte is situated between two of the ravines, the external appearance of which is whitish, but internally it is of a deep brown color. The asphalte is equally diffused throughout the rock, in some places more or less saturated, but in others the calcareous matter is quite pure,* leading to the conclusion, that the asphalte is ramified in veins in the mass under the molasse. The calcareous asphalte is not stratified, fissures are seen intersecting each other in all directions. Various are the opinions of its formation, but the following is the most probable,—that it has been generated by heat naturally acting on the bituminous matter below strata of carbonate of lime; some of the bitumen has passed up and mixed with the lime, by nature adjusted in just such proportions as the lime would absorb, thus has been effected by a natural force, what by art could not have been, and it is this which renders this material so far superior to any manufactured article.

The resinous and sulphuric particles have passed up to the surface and formed a crust, so that the inflammable qualities, as well as the naptha have been destroyed by volcanic agency, and the material is not liable to ignition. The calcareous asphalte contains from 15 to 18 per cent. of bitumen, the remainder is carbonate of lime. The bitumen from the results of experiments of a French chemist is found to be a compound of

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* Bulletin de la Societé Geologique de la France, Vol. VIII. p. 138.

Resinous petroliferous matter, ...	60 to 70
Carbon, ...	30 to 35

It is from the carbon that the dark color and property of hardening in the air arises which renders it so useful in the arts. The spaces below the carbonate of lime are fissures containing the mineral pitch, which is formed of the heavier particles of bituminous matter and carbon in another form, probably having experienced greater heat. As used in England and the continent, the asphalte is reduced to powder by baking, and being mixed with a proportion of about one-tenth its weight of the pitch and a fine grit, is reduced to a semifluid state, and poured on to the spaces or moulds prepared.

For exportation, however, the substances are formed by the Company in England into a mastic, and sent to distant parts in blocks of a cwt. each; by this means it is rendered useful to those who may not have had the advantage of witnessing the mode of application in England, as the mastic has merely to be heated, and laid down in the way which will be described hereafter. The mastic possesses nearly the hardness of stone, but preserves a certain elasticity which prevents the surface from wearing or chipping, and carriage wheels and horses' hoofs cannot disturb the evenness and regularity of its surface. Not the least of its valuable properties as a material for building purposes in India, is the facility of its removal from place to place; after having been laid down as a terrace in one building for years, it may be taken up, and requires merely to be reheated to be laid down elsewhere with equal utility. It is anti-electric, which makes it valuable for roofing purposes, and is not inflammable, the quantity of pitch being so small. The late fire at Hamburgh is proof of the non-inflammability of the material, for the roofs of many houses were terraced with it, and great alarm existed lest these roofs should burn and cause more devastation; they fell in solid masses unconsumed, and instead of serving as fuel, extinguished in their fall, the flames beneath them. It is wholly impervious to moisture, and can be extended indefinitely, and

and even where joints are necessary they can be so closed as to present a continuous surface; neither does it impart taste, smell or color, to any liquids that may come in contact with it when employed to line tanks, vats, reservoirs, &c. Having thus stated its origin, composition and essential qualities, I will proceed to the modes of its application.

The purposes to which it has been applied in France are so extensive and various, that they first claim attention. The Chevalier de Pambour states, that the pavements in several crowded thoroughfares of Paris have been made of this substance for the last six years,* and are now in excellent order. It has resisted the oscillation on suspension bridges and the varying temperatures of heat and frost, the asphalte being on such structures as perfect as the day it was laid down. For roofing edifices, lining water reservoirs, and paving stables it has been particularly useful, having been laid down seven years in the stables of Cavalry Barracks. It has been extensively applied in the fortifications of Lyons, as stated by M. Gahan, a Captain of Engineers, also at Lisle and Vinceunes, and the Artillery have covered the roofs of warehouses several years since in the arsenal at Douai, which have withstood all weathers. The naval department also have made numerous trials of it in the various buildings at the port of Toulon, and it is being introduced into the other ports of France. The pavement formed of it resists better than stone the friction of chains in Dock Yards; and in Jails and Hospitals it has been used not only on account of its durability, but that it keeps particularly clean, and ablutions are performed more easily on it. The material is also used on the "Pont Royal," and "Pont de Carrouse," on the areas round public fountains, in the court yards and extensive floors of colleges and churches.

It has been employed as a cement, and is more particularly valuable under this head for hydraulic works; several large tanks have been constructed in Paris with it. The mode adopted has been to cover the faces of the bricks that were to be exposed to the water with a very thin coat of asphalte; they were set in fluid mastic instead of cement, which was also poured into spaces, left for the purpose, of one-fourth between the inner and outer bricks forming the side walls as the work advanced. The bottom was afterwards covered with three-eighths of the mastic. Its use as a cement for hydraulic purposes is not new, for Buffon in his Natural History, article "Bitumen," says, "J'ái fait enduire il y a trente six ans un assez grand bassin du jardin "d'histoire naturelle qui depuis a toujours tenu parfaitement l'éau." That Buffon did so write is stated in a pamphlet called "Observations generales sur les mines bitumineuses du Parc de Pyrimont." In the "Place de la Concorde," in the centre of which the Egyptian obelisk is erected, about 24,000 square yards of most magnificent pavement are laid down of asphalte in elegant mosaic work, the fluid substance was spread in moulds of bar iron of the required pattern, which in this instance is alternate squares of black and white, each square having a circle of the opposite color to itself, in the centre. At the estate of the Baron de Montmorenci is a conservatory floored in the most splendid manner, the substance being formed into patterns of foliage and scrolls, with a rich Grecian fretwork border. In London it has been used in several places; the noble piece of pavement at Whitehall and the carriage drive to the Ordnance Office may be cited as examples. The roofs and terraces of several noblemen's houses are covered with it, and its efficiency universally acknowledged. In the manufacturing towns, the floors of large workshops and store-rooms are laid with asphalte, and the terraces of many sheds of railway stations. The whole of the arches of the Greenwich railway are covered with it, with a view of preserving that extensive viaduct free from damp. It is used as a foot pavement in many of the metropolitan parishes and in country towns also, and one of the principal streets of Liverpool is paved with it. To such a mass of evidence of the great utility and value of the material, as it has been applied in Europe, there is to be added the experiment of its efficacy as lately laid down in Calcutta, the Court of Directors having permitted the writer of this memoir to bring out a ton of the mastic for the purpose of testing its fitness for the public service. Petroleum oil is to be found in the neighbourhood of Rangoon, and on the Irawadee N. E. of Pegu and elsewhere, which substance, after the naptha is distilled from it,* will answer as a substitute for the mineral pitch and render the asphalte cheaper to use in India, as the pitch need not be exported. In case some such expedient should be resorted to, I will here annex the cost of the separate material, as well as of the mastic or compound as sold by the Proprietors in London.

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* This was stated in 1840.

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* The price gained for the naptha might cover most of the expence of procuring the Petroleum. Limestone impregnated with bitumen, dried, ground and mixed with its own weight of coal tar is an admirable cement, and will form a most desirable terrace; its mode of using, the same as asphalte.

1	Ton of Asphalte powder	£5	0
	Cask, &c.	1	4
	Mineral Pitch, (proportion 2 cwt.)	1	18
	Total, ...	£8	2

The mastic is in blocks of 1 Cwt. each 18 × 6 × 4 and £6 10s. per Ton; with the mastic however a little pitch is necessary to flux the first quantities when using, as will appear presently.

1	Ton of Asphalte, or ..	20 Cwt.
	Fine Grit, ...	8 do.
	Pitch, ...	2 do.
	Total	30 Cwt.

will cover a space of 400 feet 3/8 thick for flooring. Exported in large quantities the cost of 100 superficial feet would be from 12 to 15 Rupees, exclusive of the substratum of concrete.

Instructions for use.

The mastic being ductile, great care must be taken to have a good foundation of concrete, or lime gravel, or broken bricks, with a thin coat of hydraulic mortar over all, the surface being made level: on this the mastic in a semifluid state is laid 3/8 in thickness.

Mode of preparing the Mastic for use.

In the absence of a proper cauldron, such as is shewn in Fig A. a large pitch pot may be used over a strong fire; the blocks are broken up to the size of 5 or 6 ins. cube, and put into the cauldron with 1 per cent. of pitch to flux the lower layer; more mastic is put in by degrees when the first quantity is melted, which will flux the rest in succession, care being taken to stir it the whole time with the instrument shewn at B.

When the Cauldron is full or a sufficient quantity melted, and it has assumed the consistency of jam, it is fit for use. If the work is ex- to have been fixed only with respect to existing *aurangs*: new ones

tensive, a number of cauldrons should be heated at once, as one of the indicated dimensions will not lay down more than 70 supl. feet.*

In laying it down, a lath of the required thickness of the coating, is placed across the floor or roof prepared as above, which from the wall or curb, as the case may be, should divide the whole space into compartments of about 2/6 wide. It is necessary before laying down the mass to cut a small channel (if for a floor under the wall, if for a terrace close to the curb) of 2 ins. wide and 1 deep, into which hot mastic should be poured, and taken up again when settled in order to warm, and enable the whole to bind and adhere at the edges. Into the compartments above-mentioned the mastic is poured with a large ladle, the bowl of which should be a foot in diameter and 6 inches deep, each ladleful, as it is poured in, is rubbed from the centre towards the wall or curb with a wooden float (made of cask staves), and a smoothing rod of 3 feet long and 2 feet square is applied to level the surface by a man immediately in rear of the one who uses the float, who also whilst the substance is still hot sprinkles a powder on the surface through a very fine sieve, composed of the finest sand and unslaked lime, reduced into an impalpable powder in equal quantities, which is rubbed in with a flat board, and gives a white surface to the terrace which does not wear off. The surplus is carried forward with such a hand brush as the figure shews, at C as soon as the liquid material is smoothed. Care should be taken to force the substance well into edges and joints, and in removing the gauge rod not to lift it, as it may raise the asphalte with it; but by a gentle tap to loosen it horizontally from the mass. In laying down at two different times, when the first layer has had time to harden, the edge must be warmed with a little hot material laid on for a minute and removed, the work then to be proceeded with directly. If a roof is covered with wood, coarse canvas should be stretched over it and nailed, and the mastic laid on that, finishing it off with a fillet, as in D of the plate. Store rooms and magazine floors should be 3/4 inch thick, stables 4/8, and carriage drives 1, coverings of arches 3/8.

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[*] The cauldron must not be left standing, as the material will burn.

Contributions towards a History of the Development of the Mineral Resources of India. By S. G. Tollemache Heatly, Esq.

No. 2. Memoranda relative to the working of Iron in Bengal.

The existence of iron in the districts of Balasore and Beerbhoom, seems to have been known at the earliest period of British rule in the country. With regard to Balasore, the following passage occurs in Captain Alexander Hamilton's Account of a Voyage to the East Indies in 1708, [vol. 1, p. 395] :—

> In two days I travelled from Badruc to Balasore, and saw nothing in the way but things common and indifferent, the product of the country being corn, cloth, *iron*, anise and cummin seeds, oil and bees' wax. Iron is so plentiful, that they cast anchors for ships in moulds; but they are not so good as those made in Europe.

In Beerbhoom, iron manufacture seems to have been of not less antiquity. The ore which abounded in the district was dug out and collected by a set of men, who sold it to the *beparries* or itinerant dealers. A trifling contribution was levied on these miners by the Rajah within certain limits, and by some other landholders in their estates. The ore was carried by the *beparries* to established markets called *aurungs*, where it was purchased by the smelters, whose furnaces or *saals* adjoined the *aurung*. At these markets the Rajah had officers who levied a duty from the smelters in proportion to the quantity manufactured: part of the levy was made at the *kot-saal* or roasting furnace, and part at the *khamar-saal*, where the iron was finally prepared for use. The whole of the collections thus made was entered under the head of *loha mahal*, and was kept distinct in the Rajah's accounts from the rent of the land in which the *aurungs* lay. The Rajah again paid a certain assessment on his profits to Government, which assessment was also designated by the term *loha mahal*. The same item of Government accounts comprehended also the payments made by the few detached landholders, to whom I have before alluded as imposing duties upon the miners in their estates. This detail will I think, in conjunction with the narrative that follows, shew clearly, that the right of ownership of the iron was vested in the sovereign authority, the zemindars only claiming property in the ore by right of consideration paid into the treasury. Further, the right to the mineral products of the land was distinctly separated from the right of cultivation on the surface.

In 1774 a proposal was submitted by Indernarain Sermono to the Burdwan Council, and by them to the Presidency one. The correspondence is as follows :—

The Burdwan Council to Government.

* * We transmit you copy of a proposal, which has been delivered to us by Indernarain Sermono, for clearing away the jungle, and manufacturing iron in a mountainous part of the district of Beerbhoom, together with the sketch which accompanies it of the tract of country, for the lease of which he has applied. We beg leave to submit it to your consideration, and have only to observe, that by an inspection of the Mofussil accounts, none of the places mentioned within the boundary he has described, appear in the jumma of 1178, and that from the inquiries we have made, we believe that tract of country to be in the unfruitful condition described by him.—19*th September*, 1774.

Indernarain Surma's Proposals.

In the province of Beerbhoom, there is a considerable tract of mountainous country overrun with jungles, and which, in its present uncultivated state, serves no other purpose than that of a harbour of *Choars*, who live upon plundering the inhabitants of the cultivated lands. Within this space, there was formerly a village called Hatgatchya, situated about a coss south of a hill called Monsa Pahr (both in the Pergunna of Mallarpore). At first this village was much injured in 1174 and 1175 by the depredations of the *Choars ;* and in the year of the famine, the whole of its inhabitants deserted the country around the village. On the north side three coss, on the west three coss, on the south three-quarter of a coss, and on the east two coss is an entire jungle, and yields no revenue. Accompanying is a sketch of it. This tract of country, in many parts of which iron ore is to be found, I request the lease of, on the following terms :—

The lease is to be granted to me for 7 or 10 years; for the first year, on account of the great expense which I shall incur by cutting the jungle and erecting *saals* (or smelting places), I can pay nothing. For three following years I will pay 2000 Rs. per annum, and for the remaining years of the lease, I will pay 5000 Rs. per annum, which shall be in full of all rents or customs whatever.

I will engage, if business succeeds, to supply Government with what iron they may want at the bazar price of the time they may demand it.

I will not force any ryots from the Malgoozary lands, nor give protection to any who may desert with arrears of rent due to the farmers.

The *Choars* and mountaineers, who at present infest the Malgoozary lands, and by their violence cause the ryots to desert, will themselves engage in the working of iron. They gave me assurance of this, when I was lately in that country. I have travelled over the greater part of the country described in my sketch; I am confident no part of it is either included in the jumma of any of the present farmers, or yields any revenue to Government; but should I be mistaken, and it be hereafter discovered to contain any jumma lands, I will readily pay the highest rent that has been received from it since the beginning of 1178.

If the above terms are accepted and a grant given me—should Government, at the end of my lease, think proper to take it into their own hands—in consideration for the expense and trouble I shall have been at, I request a preference in farming it. In case they should not deem this advisable, I request to be allowed, for the expense of all the buildings I may have erected, whatever shall be determined to be their value by an Ameen sent by Government.

Government to the Burdwan Council.

We approve of the proposals offered you by Indernarain Surma, for clearing a part of the waste jungle lands of Beerbhoom, and manufacturing iron; and authorize you to grant him the necessary deeds accordingly, receiving from him such writings in return, as may bind him to the performance of his engagements with Government, and the observance of the conditions he himself proposes.—*23d September*, 1774.

Nothing more with reference to this attempt appears on record. Perhaps the speculation was of too sanguine a complexion, as the high rents offered lead us to apprehend, and was silently abandoned on second thoughts by the projector. One thing is, however, proved by it, and that is the *loha mahal* already accruing to Government seems to have been fixed only with respect to existing ***aurungs:*** new ones might be founded and brought into operation by the enterprize of individuals on their payment of a consideration to Government. The farmers of the existing *aurungs*, among whom the Rajah of Beerbhoom was the principal one without comparison, do not seem to have been at all consulted as to the lease. They could not therefore have had any right to the mineral product beyond what was specifically granted by Government, for the amount of consideration received. I am anxious to draw attention to this fact, as this very pergunna of Mullarpore became subsequently the scene of a hotly contested law-suit, involving the tenures of these *loha mahals*.

The next attempt was more fortunate. It was by Messrs. Motte and Farquhar. In all similar transactions of that period, one partner was, for obvious reasons, chosen from among the influential residents of Calcutta. His watchful presence at the focus of intrigue was required to defeat the machinations of interested parties, and enable the others, the working bees, to pursue their speculations in comparative quietness. To this *patron*, his *clients* could with ease afford a share of the proceeds at a time when the profits of trade were enormous, and he returned them, what was then indispensable—political protection. Thomas Motte, the patron of the firm in the present case, was the Superintendent of Police in the city, and an intimate friend of Warren Hastings. He had been employed in 1766 by Lord Clive, on a mission to Sumbhulpore, to open a trade in diamonds with that country ; a previous attempt by Captain Mallock, under the direction of Henry Vansittart having failed. Motte's endeavours were equally unsuccessful,—a result which he attributed to the indolence of the inhabitants, and the iron rule of the Mahrattas, who at the period held the country as far as the Soobunreeka. An account, intersting in all its features, of this expedition drawn up by Motte, appears in the Asiatic Annual Register for 1799. He was an enterprising character, though he did not seem to take much interest in the iron speculation about to be narrated : and from some of the partizan pamphlets ,that were showered about so thickly during Hastings' trial, I learn that he must have died a little before it, broken in spirit and fortune.

John Farquhar is not unfamiliarly known to many of my readers as the individual who subsequently purchased Fonthill Abbey, from the celebrated Beckford. His peculiarities, his parsimonious habits, his shrewdness, his eye ever watchful over his interests, were sketched with great felicity in that cleverest of periodicals, Knight's Quarterly Magazine, in " An unpublished episode in the Life of Vathek."

Steel through opposing plate the magnet draws,
And steely atoms culls from dust and straws ;
And thus our hero, to his interest true,
Gold through all bars and from each trifle drew.

But the qualities which emphatically make *the man,* as distinguished from the merely social man—the bold speculative genius, the independent character, the untiring perseverance, the readiness to grapple with obstacles, the skill to overcome them—these do not fall within the province of the light *littérateur.* They are written in an alphabet and a language of their own, impressed in indelible characters upon the freedom, the national character, or the commercial prosperity of the country, where such men have existed. They may be forgotten, or they may become inappreciable to careless observers in the lapse of years : but they continue to exert an influence, not loud but deep, through time—as surely as are propagated the undulatory impulses

From world to luminous world afar,

though infinite to the failing sense may seem the spaces between. Such qualities mingled in the character of John Farquhar : they won for him prosperity in his lifetime : and respect from those whose respect compensated for the gibe of the jester.

The Memorial submitted by these gentlemen to the Council of Warren Hastings, I subjoin entire :—

HON'BLE SIR AND GENTLEMEN,—Having the greatest confidence that any scheme proposed for the advantage of the Hon'ble Company, or for the good of this country, will always be received in the most favorable, and discussed in the most candid manner at your Hon'ble Board, we beg leave to offer to your consideration the following plan, for casting the H. C.'s shot and shells in Bengal, and for working a lead mine lately discovered in Ramghur.

The first part of our plan, you well know, Gentlemen, is no new scheme ; for it appears by the following quotation from a letter of Lord Clive and the Select Committee in the year 1765, that the casting of shot and shells in this country had been deemed by the Company an object of importance. "The iron-founder whom you sent out in the Kent died on his passage to this, "place; but as the casting of shot and shells in this country is an object "of great importance, we strongly recommend that you will supply the "loss as soon as possible, by sending three or four persons well versed in "that business, that our whole design may not be frustrated by such "an accident in future."—[*No.* 86 *of Appendix to Report from the Select Committee of the House of Commons, Vol.* 1.]

In consequence of this application, a Mr. St. Quintin was sent out: but he likewise died a short time after his arrival.

We suppose that on account of the death of those two founders, and of the great expense of the cannon foundry, the thoughts of this undertaking have been laid aside: for we conceive that every reason which at that time made it to be looked upon as an object of importance has ever since remained equally forcible, and the present aspect of the affairs of Europe appears to us a very powerful additional one.

Besides the advantages which the Honorable Company proposed to themselves by erecting an iron foundry in Bengal, we beg leave to mention some others, which we have reason to imagine were not at that time thought of. Should iron trucks, lately introduced for garrison gun carriages, be approved of by the Board of Ordnance, the supplying of them here would certainly be very desirable.

But the greatest object, and which perhaps in time may be esteemed of considerable importance not only to the Company, but even to the nation, is the casting of cannon and mortars of a quality, superior to that of the ordnance of any other state. For amongst the various ores produced in this country, there is one found in Beerbhoom, and in great abundance in Ramghur, which yields an iron so extremely soft, as to be fit for few of the common purposes of life: but this property renders it in an eminent degree superior to all other kinds, for almost every work in cast iron, and particularly for the fabrication of cannon.

This quality the celebrated M. Reaumur, M. Buffon, and some others of the most eminent French naturalists and mineralogists, have been long endeavouring to give to cast iron, principally with a view of improving the artillery,* and their labours have been much approved of by the Ministry. The same thing has been lately attempted in England, but without much success. The only iron ore that we know of, possessing nearly the same property, is one, amidst upwards of 60 different kinds, described by the Abbé Chappe, the produce of Siberia, and he regrets that the iron of it is not more known in France.

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* Witness two Memoirs by M. Buffon; the one on the "Smelting of Iron Ores," the other entitled, "Observations and Experiments made with a view to improve the Art of "casting Iron Cannon. Paris 1775."

Now we conceive that by casting that peculiar iron in the form of kentledge, and by exchanging it with that of the Europe ships, such quantities of it could be sent to England, as would be a valuable addition to the Honourable Company's commerce, and the Europe kentledge might be sold to advantage for the use of country ships: for besides its being as admirably adapted to the fabrication of artillery, it would be of equal value for several other uses, but particularly for wire-drawing, and we flatter ourselves that it might be the means of securing to some of the British manufactures that superiority which they have hitherto possessed over those of every other nation.

The benefits which would accrue to this country in particular from the establishment of iron works would undoubtedly be very considerable, for at present vast numbers of cast iron pots, frying pans, and other utensils are yearly imported into Bengal from China, and are sold at very high rates; but by supplying the market with these articles manufactured within the Company's possessions, not only considerable sums would be saved, but a valuable branch would be added to the exports of this settlement. Cylinders for sugar mills, boilers for sugar works, salt works, saltpetre works, and for several other purposes are much wanted: and there is no doubt but they would greatly contribute to the improvement of those manufactures. Cast-iron rails, pale-gates, and rails for staircases and balconies, would add much to the beauty, as well as to the convenience of the houses in Bengal. And every merchant will allow, that iron kentledge for the country ships, especially such as are employed in the cotton trade, is an object of the greatest importance to the commerce of this port. How far it would be politic to give such encouragement to the manufacture of bar iron and steel in the Western Provinces, as would enable them to supply all Bengal, and consequently to prevent the other European nations from importing any, you, Gentlemen, are best able to judge. This would undoubtedly be highly beneficial to the country, both by furnishing the implements of agriculture readier and at a much cheaper rate than they can be procured for, at present; and by saving very considerable sums which now go to Balasore for Mahratta iron and steel, with which last article these provinces, you well know, Gentlemen, are very ill supplied. And certain it is, that this could in no way affect the interest of the mother country: for it is well known, that instead of being able to exports iron and steel of the produce of Great Britain, she is obliged to import at least two-thirds of what is used in her own manufacture. Nor will the increase of iron works in England ever be judged good policy, as they have already destroyed some of the finest forests of oak, and as the workmen required for them can be employed to greater national advantage in the finer manufactures. We know that the French have, within a few years past, erected some very fine forges in the Isle of France, whether with the view of being able to undersell every other nation trading to India, in the articles of iron and steel, or of supplying the country powers with artillery in the most secret manner—we cannot pretend to say: but from the extreme lowness of the price of slaves there, we think it highly probable, that they will be enabled to do both as soon as the islands are sufficiently cultivated to produce provisions in plenty for their inhabitants, especially as it appears from what M. Bougainville (in his Voyage round the Earth,) says of those works, that their owners are supported by the French Government.

We shall now, Gentlemen, take the liberty to offer our sentiments with respect to the utility of working the lead mine in Ramghur. This mine consists of one small vein, which produces the ore known to mineralogists by the name of Potter's lead ore, because instead of being smelted on account of its metal, it is usually sold with greater advantage to those artificers for the purpose of glazing their wares. Now as no people make more use of earthenware than the natives of this country, and none are worse provided with materials for glazing it, the only means of rendering it neat or cleanly; or capable of containing fluids for any considerable time, we presume it would not be very difficult to introduce this improvement into common use. Besides, as all lead ores are known to contain a certain portion of silver, though generally too small to bear the expense of extracting it, we might perhaps find this ore worth treating upon that account, since fuel is remarkably cheap in Ramghur, and since the litharge into which the lead must be converted in order to obtain its silver, would answer still better the purpose of the potter than the raw ore.

Another beneficial consequence of working this mine would be, the supplying of the market at Patna with lead ore: for at present considerable quantities are carried thither, and sold by the name of *surma* (antimony). This ore is brought from countries to the westward of any of the Company's possessions, and is used by the country people chiefly for colouring their eyelids. We have had it very accurately assayed, and can pronounce with the utmost degree of certainty, that it is a true lead ore, not containing the smallest particle of antimony.*

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* I might as well state here, on the strength of repeated analysis, that no small portion of what is sold at this day in the bazars, under the name of *surma*, is a sulphuret of lead without a particle of antimony. To those who physic their own horses, this hint may not be valueless.—S. G. T. H.

This undertaking would certainly prove very advantageous to the province of Ramghur, by procuring employment for a tribe of people found there and in the neighbouring provinces called *Coles*, who at present live in the jungles almost in the state of nature: yet although totally unacquainted with the conveniencies and comforts of a settled and civilized state of life, they are easily induced to quit their retreats, and are then found to become tractable and good labourers.

But we find our letter has extended to a length we little thought of: we shall therefore, Gentlemen, intrude no further upon your time, dedicated to affairs of so much greater moment, than to propose to you the terms which we think would enable us to carry our plan into execution.

After having obtained the best information in our power, we are of opinion that the pergunna called Jerriah, lying between the rivers Dummooda and Barracar in the province of Pachete, is the fittest situation for the iron work. The river Dummooda is navigable as high as that place; it abounds with iron ores, and has the singular advantage of being contiguous to the coal mines of which Messrs. Sumner and Heatly have a grant.

We propose then :—

I. That a sufficient quantity of land in the pergunna of Jerriah in Pachete, (or in any other province if appearing more advantageously situated for that purpose,) be assigned to us, for erecting the iron furnace and warehouses, and for the habitations of the workmen and labourers, to be held by the same tenure, by which Messrs. Touchet and Prinsep hold their lands.

That a like quantity of ground be granted to us for similar purposes, and on the same condition (if at present paying rent to the Company) at the lead-mine, but if Jaghire, that we be permitted to buy from the Jaghiredars such lands as may be requisite for the settlement of our people, and particularly Dungherra valley, without which it would be impossible to carry on the work, as the Jaghiredars we well know would levy such heavy contributions on our workmen, were they in their power, as would prevent them from working under higher wages than we could afford to give :—

II. That we be granted the exclusive privilege of working iron and steel in the European manner within any part of the Honorable Company's possessions which lie on the west side of the meridian of Burdwan, and of selling the produce of such manufacture, free from duty, in any place under the presidency of Fort William, for the term of nineteen years. That we be granted likewise the exclusive right of working the mines of whatever ores or minerals are not at present wrought by the country people within the aforesaid limits for the same number of years. By this article, however, we have no idea of prejudicing the rights of Messrs. Sumner and Heatly, who, you know, Gentlemen, have the exclusive privilege of working the mines of coal, or of any mineral or metal, iron excepted, within certain districts of Beerbhoom and Pachete:—'

III. That we enjoy the immediate protection of your Hon'ble Board, and be in no manner subject to the direction or control of the Burdwan Council, or of any of the Company's servants resident in the provinces within the above-mentioned limits, because should the Hon'ble Company ever be pleased to allow their officers of revenue the benefit of trade—it is obvious how much our works would interfere with their interest; and in case of disputes happening between the Zemindars or Farmers, and our Agents, they would sit as judges partly in their own cause. But that should any disputes arise, they may be determined by arbitration, or if becoming of a serious nature, by Commissioners sent from the Presidency—we obliging ourselves to abide by the decision of your Hon'ble Board on their report, and if found in the wrong, to pay the expense of such inquiry:—

IV. That we be permitted to employ Europeans in our works; we giving security, if required, for the good behaviour of those employed in the execution of that part of our plan which is of a private nature, but that such as may be required on account of the Hon'ble Company's work be on the same footing as the artificers of their contractors, who enjoy the greatest privileges:—

V. That we be allowed to take into partnership any person or persons whom we may at any time judge necessary to assist us in conducting our designs:—

VI. That on our part, we engage to erect furnaces and all other necessary works, and to keep workmen in constant readiness at our own expense, and that on application being made to us for any number of shot and shells, we oblige ourselves to begin the casting of them immediately, and to employ our furnaces for that purpose only, until such number be completed; and to deliver them at Fort William at four-fifths the price which the Hon'ble Company's shot and shells now stand them when landed at the same place:—

VII. That after the expiration of two years from the time of opening the lead mine, we allow the Company one-twentieth part of the profits which may accrue to us by the working of it, to be estimated by the profits of the two first years:—

VIII. That as the exemption from duty of our bar iron may be prejudicial to the interest of the persons who farm the *Loha mahals* in Beerbhoom, we engage to take their farms on the terms and conditions by which they are at present held.

We have now, Gentlemen, done ourselves the honour to lay our design before you: happy shall we be if it meet with your approbation, as we then hope, and indeed make not the least doubt, that you will give us every encouragement and assistance, which may enable us to carry it into execution. We have the honor to be, &c. &c.

T. MOTTE,
JOHN FARQUHAR.

Calcutta, the 4th Nov. 1777.

The proposal was the same day sent to Mr. Alexander Higginson and the Provincial Council of Burdwan, with instructions to report on the facts stated; whether the grant solicited would prove of detriment to the state or to private interests; to detail the statistics of the pergunna Jerriah, and to give such other information as may bear on the subject of the proposal.

Two months having elapsed without any answer being returned by the Burdwan Authorities, their memory was refreshed by a *takeed* at the suggestion of Mr. Farquhar, who from this time appears alone in the transactions connected with this speculation. I annex the reply complete:—

The Burdwan Council to Government.

HON'BLE SIR AND SIRS,—We have received your commands of the 6th instant, requiring an immediate reply to your letter of the 6th January last, respecting the proposals made by Messrs. Motte and Farquhar.

As the information you were pleased to require appeared to us of such a nature that the event of the proposals depended much upon our answer to the several points which we were directed to investigate, and as the distance of the pergunna Jerriah rendered it impracticable for us to ascertain the necessary facts without a local inquiry, we therefore stated them to Mr. Hewett at Jellda, who in consequence sent an Ameen named Seebnarain into the pergunna Jerriah, and who, you will perceive from the enclosed translation of his letter to Mr. Hewett, could not obtain any account of the amount of the Jaghire lands in that pergunna, though from the said letter it is fully evident, that the Zemindar and inhabitants appear to be pleased with the prospect of having an iron manufactory established in the country. The annual revenue to Government of the pergunna Jerriah is Rs. 2661. We have directed Mr. Hewett to use his endeavour to obtain further information, which should we receive, shall be immediately transmitted to you.

The death of the late Rajah of Beerbhoom we conceive has been the principal cause of our not having received the information required from that district. We however expect it daily, and will immediately transmit the particulars.

From the materials and information we have hitherto been able to obtain, we do not deem ourselves competent to give a definitive opinion, but as we conceive, allowing in general that the introduction of a new manufactory into any district must be beneficial to the public as well as to individuals, that the greatest difficulty Messrs. Motte and Farquhar will have to struggle with, will arise from the Jaghiredars and other landholders in Jerriah. We would therefore recommend to those gentlemen to make themselves acquainted with the difficulties which we apprehend, and to endeavour to obviate them, before they commence their manufactory, by reconciling the landholders and other inhabitants of the several districts in which they propose to be engaged.

Burdwan, the 13*th March*, 1778.

Report of Seebnarain to Mr. Hewett, referred to in the above.

Five days before my arrival, Rajah Mohunt Sing, with all his family and servants of every denomination, had gone into the jungles; not one of them attended me. I sent the perwanna you gave me for the Rajah by the hand of one of his people to him; upon reading the perwanna, he said that he was willing to furnish the articles of merchandize, (to wit iron,) but that he could not produce the Jaghiredars: that he would give his assistance in every thing which was required of him. This message he sent by one of his own people. If the Jaghiredars abscond, how is it possible for me to send you the accounts you require? You will be informed of every thing by the Moonshee, that not a cowree of money has been received upon account of the three Turoffs up to the month of Maug. The people are, through rascality, wandering up and down the country. Munsab Kell, &c. who went to Burdwan, have been arrived here three days. The Zemindars and all the people are pleased with the proposals for manufacturing the iron.

A more interesting report was sent in by Mr. Ramus, the Collector of Ramghur. This gentleman, at his entrance into the service, had been placed as assistant to Mr. Heatly in these districts. He was well known to his contemporaries as a devoted sportsman.

The Collector of Ramghur to Government.

HON'BLE SIR AND SIRS,—I have been honoured with your letter of the 6th instant, enclosing a copy of the proposals from Messrs. Motte and Farquhar, for casting the Hon'ble Company's shot and shells in Bengal, and for working a lead mine lately discovered in Ramghur. In compliance with your orders, I do myself the honour of giving you every information in my power on the subject of both.

In the province of Ramghur, and in several contiguous pergunnas, an iron ore has been discovered these many years past, and worked both by the natives and by families who have long settled here merely to carry on the employ. They have ever met with great encouragement, as it has been productive of two very good consequences —an inducement to the Calcutta merchants to negotiate in these parts, and a duty on its transportation, in which article the greatest part of the *Sayer* is comprehended, which enables the Rajah to make some addition to the Hon'ble Company's revenue besides a consideration he annually receives from the heads of the trade for his permission and protection

The iron is esteemed a very inferior sort, nor has the undertaking ever been carried on anywise extensively, owing to the great scarcity of labourers, (the country in general being much in want of ryots,) and their simple and tedious method of working it.

There is not a doubt from the quality of the ore, that the plan proposed may be prosecuted with the greatest ease, but not I imagine without being in some measure prejudicial to the country as so capital an undertaking would require more workmen than these provinces could with convenience spare. Ramghur in particular severely feels that want, for there are many villages in it, and I may say pergunnas, almost wholly depopulated. The tribe of people called *Coles* are the immediate natives of Nagpore, who seldom leave that country but in small numbers, which even then proves hurtful to the neighbouring countries, unless shortly restored.

As the Company have never profited by such discovery any further than by a trifling increase of revenue, nor on the present mode does it promise any greater, should the proposal of Messrs Motte and Farquhar appear to the Hon'ble Board advantageous, the only public detriment will be their great call for labourers, and the remission which the Rajah would apply for, to be made from his settlement, of as much as the duty and allowance annually amounts to

With regard to private property, it would no farther be a prejudice than by obliging those to discontinue the business, who have for many years past been concerned in it, and who have made the necessary advances for a continuation not that any of the labourers have purchased the spots, or entered into any agreement with the Rajah for his permission for any length.

The lead-mine having been so lately made known and worked to so trifling a degree, it is not in my power to give you any very particular information concerning it. The vein runs but a short way, but the appearance of the adjoining spots gives every reason to imagine it does not terminate in that one alone. The situation is southerly of Chattra, about 8 coss in the pergunna of Colrampore: the mine is at a place called Seedipore, the Jaghire of one of the Rajah's family, who concludes the mine not to be lead but *Surma;* on which account he has never taken any steps towards working it.

I should have visited the place immediately I was honoured with your letter to have more fully informed myself, did not the troubles which prevail in many places here render my preſence at Chattra absolutely necessary.

Ramghur, 19*th January*, 1778.

On the 17th March, the Government wrote to the Burdwan Council to put Mr. Farquhar in possession of the iron mines of Pachete, and to grant him such formal authorities as may be requisite: he satisfying the Zemindars or Jaghiredars for such rights as they may possess. On Mr. Farquhar's receiving a notice to the same effect, he addressed Government in reply, begging that *Beerbhoom* might be inserted instead of *Pachete,* in the instructions to the Burdwan authorities, as the ores of Ramghur and Beerbhoom are by much the fittest for cast works: while those of Pachete on the contrary produce a brittle short iron, which, though good enough for shot and shells, is by no means proper for the fabrication of cannon. He also states his reason for specifying Jerriah, to have been its central situation between Beerbhoom and Ramghur, and concludes with *begging permission to observe that*—

> " Were he allowed to hold the iron farms at the rents which they at " present yield to the Honourable Company, every source of dispute with " the country people would be obviated, and the peons requisite for the " collection of the duties would afford sufficient protection to the works " against the hill people without a guard of Sepoys, which I am informed " will otherwise be absolutely necessary."

The Government made the requisite alteration of name, but took no notice of the concluding hint. Farquhar, however, was not the person to yield his point so easily; and without stirring from Calcutta, he not only repeated the application, but rather considerably increased its extent:—

Mr. Farquhar to the Government.

HON'BLE SIR AND GENTLEMEN,—It is with the greatest reluctance I bring myself to trouble you with a fresh application, but the many inconveniences I foresee I should have to labour under in executing your orders of the 20th February, if possessing no influence amongst the miners, oblige me once more to request that you will be pleased to grant me the farm of the duties on the Beerbhoom iron. And as this has no connection with the farms of the land, and yields to Government only 766 Rupees a-year, I flatter myself that you will not deem my request unreasonable.

I beg, Gentlemen, that you will likewise please to order that I be furnished with a letter of credit on the Burdwan Council, to the amount of five or six thousand Rupees for carrying on the works.

Calcutta, 28th April, 1778.

The Council ordered the farm of the iron mahals to be made over to Mr. Farquhar, but considered the advance unnecessary, as their orders of the 20th February, related to the experimental casting of four guns, which they now revoked.

Farquhar went down into Beerbhoom, and soon found his shrewdness sufficiently tasked by the natives, with regard to the settlements he was expected to make with the Zemindars.

Mr. Farquhar to Mr. Marriott and the Council of Burdwan.

GENTLEMEN,—I beg leave to trouble you for a few minutes on the subject of my farm of the iron mahals of Beerbhoom.

On my arrival here, I found that the rents had been raised the year before from 766 Rupees to 3,262 Rupees; at the same time it appeared by the papers of the Aurungs, that the whole collections did not amount nearly to that sum. I found likewise that the same person held the farm of the iron mahal and of the Noony pergunnah, and that at the very time when this increase was made on the mahals, he got an abatement of 4,471 Rupees on the pergunnah, by which he was in fact a gainer of 1,975 Rupees a-year.

The reason of this voluntary increase on the mahals was not difficult to discover. By this means the farmer imagined he had secured to himself the constant possession of them, as the people at the Aurungs were sensible that the sum collected was much less than this nominal jumma.

The Malgoozaree of Belputtah is estimated at 131 Rupees, on the supposition of there being sixteen *saals,* (furnaces,) but in reality there are only eleven. Debra Mourissa, Azimnagur, and Ahmednuggur are valued at 169 Rupees, where there has not been a single *saal,* nor scarcely an inhabitant since the famine. I would, Gentlemen, send proofs to you of what I advance, were not one of your members, (Mr. Pye,) perfectly acquainted with the facts.

I have likewise to observe, that the Governor and Council were pleased to direct that the farm should be let to me by your Board without mentioning a word of the Zemindar, as will appear by the enclosed letter. The Rajah's Dewan, however, says, that they are still included in his *doleputtah*, and of consequence that I must hold them in *cutkina* of him. I hope therefore, Gentlemen, that you will be pleased to order them to be struck out of the *doleputtah,* and to direct that the Honourable Company's Dewan receive the rents from me at the former jumma.

Beerbhoom, 15*th October,* 1778.

The Burdwan Council examined into these statements, and finding them true, addressed the supreme authority to the effect, that believing their intention to have been essential assistance to Mr. Farquhar, in establishing and prosecuting the business of an iron manufactory at Beerbhoom, they wished to be authorized:—*first,* to let the iron mahals to Mr. Farquhar on a fixed annual jumma of 766 Rupees; *second,* to receive the jumma from Mr. Farquhar, and to strike off its amount from the general jumma to be paid by the Zemindars; and *third,* to release Mr. Farquhar from all responsibility to the Zemindar of Beerbhoom. All this confirms the view that the property was vested in Government, who were free to improve their revenue derivable from it, the leases not being *mocurruree,* by farming it to the highest bidder, or to one at least who promised to increase its value.

It was agreed by Government to fix Farquhar's jumma at the original sum, but they did not fail to direct, that the land revenue of the Noony pergunnah should be raised to its proper assessment.

Relieved from these annoyances, Farquhar seems to have set to work with some ardour, but in a few months, we find him again importuning the Government for pecuniary assistance:—

Mr. Farquhar to the Government.

Honorable Sir and Gentlemen,—Although you were pleased to countermand the directions you had given me last year, to make a trial of the country ore for casting iron cannon, I have notwithstanding applied my whole attention to that object ever since. I had resolved not to trouble your Honorable Board for any pecuniary assistance, till I should be able to produce a gun as a specimen of my work. But the expense of cutting down jungle, of erecting a dwelling bungalow, and several necessary buildings for artificers, of preparing materials for forming a dam and of cutting part of a canal for supplying the bellows-wheel with water, has amounted to such a sum, that I find myself unable to go on with the work unless assisted by Government. And I trust, Gentlemen, that you will not suffer an undertaking to fail which was formerly approved by the Honorable Company, and was twice attempted to be carried into execution entirely at their expense.

I have estimated that it will require only fifteen thousand Rupees to finish the canal sluices, &c. and to erect one furnace capable of casting a 12-Pounder. .

Should you be pleased to grant this sum, I make no doubt of your approving the following proposal. There are at present fifty matchlock-men maintained at the Company's expence, chiefly for the protection of the iron trade. As there is no check on their Sirdar, their number is never complete, nor is their appearance such as to keep the hill people in awe. Should you think fit, Gentlemen, to put them under my orders, to raise their pay from 3 to 4 Rupees, and to allow them 50 stand of arms, I would engage to clothe them uniformly, and to teach them to fire at a mark. They would then afford sufficient protection not only to the foundry, but to the adjacent country, which, in case of Capt. Browne's corps being recalled, will be much exposed to the incursions of the *Choars*.

Calcutta, 20th June, 1779. J. FARQUHAR.

Government simply requested to be informed, in answer to this letter, the specific engagements into which Farquhar was willing to enter as a return for the assistance solicited. These, Farquhar lost no time in supplying:—

Mr. Farquhar to the Government.

HON'BLE SIR AND GENTLEMEN,—As success in casting guns is not absolutely certain, it is not in my power to enter into any agreement respecting them. But should I fail in bringing them to the requisite degree of perfection, I conceive it will still be advantageous to have a foundry always in readiness for casting shot and shells. Mr. Osborne lately applied to me for 100 7-inch shells, which he was much in want of, and which it was not thought proper to spare from the stores. And some of our officers were not long ago reduced to the expedient of casting shells of a sort of bell metal for the reduction of several mud forts in the Doab. Besides, Gentlemen, I presume it will appear to you an object of some degree of importance to cast shot for the French guns that are already in our possession, or may be taken in the course of the war, otherwise they must be absolutely useless.

I propose then after sufficient time for finishing the works being allowed :—

First.—To deliver at the New Fort such shot and shells, as may have been required, at 15 per cwt. under what they at present stand the Hon'ble Company when landed at the same place, to the amount of the sum which your Hon'ble Board may be pleased to indulge me with.

Second.—To enter into an engagement for any number of years either now or after having made good the above sum to furnish whatever number of shot and shells may be demanded on the same terms, provided they be for the use of the Hon'ble Company's garrisons or armies; but that I may be allowed to supply country ships, or their captains or owners producing a licence signed by the Military Store Keeper, or any other officer authorized by Government.

Third.—To give security for faithfully fulfilling these articles.

Calcutta, 28th June, 1779. J. FARQUHAR.

This letter was followed up by the present of a 6lb. shot as a specimen of his casting. It seems not to have been smooth, which he accounts for by the small size of the furnace which allowed charcoal and dross to enter the mould. He states also, that the furnace proposed to be erected will contain 15 cwt. of metal at a time.

On the receipt of this last shot, Government surrendered at discretion, and the advance of 15,000 Rupees was sanctioned, as well as the transference of the matchlock guard.

Farquhar now commenced in earnest. In the report on the proposed construction of the Rajmahl Canal,* furnished to Government, [July,

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* If it were permitted to turn from the history of that which has been, to that which has *not* been—a parenthetical sigh might here be offered up to the memory of this undertaking; so ably sketched, and completed in all its details—on paper. "Heu! quanto minus est cum reliquis versari quam tui meminisse!" May we hope that circumstances will draw attention again to it! S. G. T. H.

1832,] by Colonel Forbes, the following allusions to his labours occur :—

Par. 116. That good building stone may be obtained in the vicinity of the More, we are aware from the fact, that in a locality adjoining it, the late Mr. Farquhar constructed a dam, (stated to have been of an excellent quality of this material,) for the purpose of turning a stream of water over the wheel of a mill proposed to be employed by him in rolling out iron prepared on the spot from the ore. This dam was considered by the late Mr. Cheap, of Surool, to present the best specimen of masonry at the time (forty years ago,) to be met with in India.

Par. 117. Broken up for its materials, and consequently neglected, it is believed that at present no part of the dam alluded to, remains. Those who knew Mr. Farquhar, will however acknowledge, that previous to embarking in such a speculation, no man was more likely to have been cautious in his enquiries, and few better able to conduct them.

Par. 118. Certain it is that had the time and talents devoted by Mr. Farquhar to the making of gunpowder been continued to his iron works, the art of manufacturing iron would ere now have been far enough advanced, to have importantly facilitated the construction of this Canal, and many other works of public utility.

Farquhar was not, however, permitted to proceed in peace. The unexpected manœuvre of renting the *loha mahal* direct from Government, had completely disconcerted the plans of annoyance already prepared by the landholders. Continual efforts were made to surprise the authorities into some orders that might afford ground for litigation on the right to the *loha mahal.* In the meantime new aurungs were established by the Zemindar, who used the uncontrolled power possessed by landholders over the peasantry of their estates, to ruin Farquhar in every way. His people were molested, fuel obstructed, miners bribed away, and perwannas for private furnaces issued.

On the 10th May 1784, a paper of proposals was presented to the Committee of Revenue, to farm Beerbhoom from Government. It contained the following paragraph :—

" That the farmer be allowed to examine the *hustabood* of the *loha mahal* which is included in the jumma, and under-farm it to such persons as the farmer shall like."

The proposals were rejected. In August, the Zemindar Zemaun Khan presented a Wazeeb-ul-urz, in which he treats the *loha mahal* as his property as a matter of course.

I request permission to encourage and improve the *iron mahal* in my zemindary, the produce of which, provided I am allowed to attend to the improvement of it without interruption or check, will in a great measure make up for the want of assets in the malgoozary mahals.

Committee's Order.—The above *iron mahal* was granted to Mr. Farquhar by the Honorable the Governor General in Council, and must remain in his possession according to the terms of the grant, as he has hitherto held it.

In September, Farquhar represented the state of affairs to the Board of Revenue, and the attempts the Zemindar made to oust him. He pointed out clearly, that he was only responsible to Government for the *loha mahal;* but that no official alteration had been made in the Rajah's *sunnud* as directed in October 1778, and the annoyance had been renewed: he forwarded his *sunnuds*, such as they were. The Board referred the matter to Government, and received orders to act vigorously. A perwanna was despatched to Beerbhoom, forbidding the Zemindar to interfere with the *iron mahal*, ordering him to send in a list of the new furnaces built, and to produce his authority for so doing.

In 1786, new authorities having arisen, 'who knew not Joseph,' the attack was immediately renewed. The Zemindar, in arrears to Government, put down Farquhar as his debtor for the rent due on the *loha mahal* at 953 Rupees, and requested the Collector to levy accordingly. Farquhar, as might be expected, calmly denied any connection whatever with the Zemindar. The Collector was puzzled; there were records, it is true, in his office, but to disturb their venerable dust! a reference for orders was made to the Board. Farquhar's *sunnuds* were at that moment in the records of the Board, never having been returned. A call was made on him to produce them. He preserved a solemn silence. The call was repeated; he was deaf. After four letters, he wrote back to request the return of certain papers deposited with them, which being done he forwarded them back with a new *lifafah* as the papers required, accompanied by a dry apologetic epistle. Here concluded this chapter of annoyances.

On his appointment to the gunpowder manufactory at Pulta about 1789, he relinquished the iron speculation, to devote the energies of his mind to the new pursuit by which, to quote Col. Forbes again, "he afterwards amassed so enormous a fortune." He however preserved the farm of the *loha mahal* to so late a period as 1795. It must then have reverted to the Zemindar. This personage disposed of parts of his estate at this time, and the purchasers commenced to levy the proprietory dues on the iron mines within their lots.

In 1799, the Rajah's affairs having become inextricably involved, the whole zemindary was put up to sale, and the lot containing the *loha mahal* was knocked down to Bustomchurn Hazra. The new owner immediately examined into all the aurungs of the zemindary, and disallowing the claim made by the private purchasers above alluded to, sued them for recovery of possession and restitution of mesne profits. The zillah judge decided in his favor. The decree was affirmed by the Provincial Court at Moorshedabad, who further added the singular clause, "that the property of all aurungs, mines, smelting houses, and other iron works lying within that district was vested in Bustomchurn Hazra." The decree was confirmed on a further appeal to the Sudder Dewanny Adalut, who however struck off the clause alluded to above, as irrelevant to the precise question, and not based on sufficient investigation. And so it certainly was. Every one had been at liberty to dig out ore from the mines, provided he paid the duty: nor had there been objections to his building his own smelting houses, &c. with the same proviso. The Zemindar certainly exercised a right to prevent new aurungs if he chose, as the supervision of them required a new establishment of officers. But the property of the works was undoubtedly in the private individuals, who built them in the aurung.

The quarrel was revived between the parties, and the Sudder Dewanny found it necessary to define the exact privileges which the property of the *loha mahal* now made perpetual, conveyed to its holder.

> The owner of the *loha mahal* had a right to all the ore of the zemindary · the sums levied on the iron manufactured at the aurungs are viewed as the consideration or price taken by him for the ore appropriated by the manufacturers. No ores were to be manufactured without paying him the established dues. He was entitled to possession of the aurungs to secure the receipt of these dues. He was entitled to cause new mines of iron ore to be opened anywhere, on condition of making to the landholder in whose estate it lay, full and liberal compensation for the value of any land which may be rendered unfit for cultivation by opening the mine.
>
> He shall not be entitled to establish new aurungs without previously obtaining the consent of the landholder for the land. He is also prevented from attempting to

restrain the manufacture of iron, and from attempting to exact from those concerned in it, any dues or payments which have not been customarily rendered.

The landholders on the other hand could not prevent any individual from taking ore from the *established* mines, and carrying it to any of the aurungs of the owner of the mahal, nor could they exact any fines or consideration for the ores so taken.

The decree of which the above is the substance, was passed in July 1811, by Messrs. Harington and Stuart, and completely defines the rights of the *loha mahal:* It is necessary to state, that the Collector in disposing of the *loha mahal* in 1799, did not specify to Government whether he had put up the entire *mahal,* but entered it as part of the *jaedad* of a particular district, Dehoche. The Court therefore referred the matter to the Board, (previous to their first decree,) enquiring whether they were willing to agitate any claim on behalf of Government with regard to the property of ore in the whole district. The intention of the reference was, that the Board might take some measure to subdivide the mahal, conveying to each lot the property of iron within its limits. No answer was ever returned by the Board, and the Court consequently limited the powers of the holder so specifically as is done above, to prevent the capricious or selfish crushing of all industry. The tenure exists on these conditions at the present day.—[*Sudder Dewanny Reports, Vol. I.* 337 *et seq.*]

N. B.—During Farquhar's labours, I find from an old newspaper, called *Hickey's Gazette,* published in Calcutta, that the market price of Beerbhoom hook iron was 5 Rupees per maund, Balasore hook iron at 6-8, and English at 10 and 11.

Journal of a Tour through parts of the Panjab and Affghanistan, in the year 1837. *By Agha Abbas of Shiraz, arranged and translated by Major.* R Lerch, *by whom the tour was planned and instructions furnished. From the Secretariat of the Government of India.*

INTRODUCTION.

In the summer of 1837, leaving my late chief (then) Captain Alexander Burnes at Dera Ghazee Khan, and accompanied by my fellow-traveller Dr. Lord, I paid a visit to Multan, for the purpose of collecting information of a commercial nature.

Meeting with Agha Abbas.

There Agha Abbas was introduced to me by my servants, as a man professing some knowledge of Farriery. He undertook the cure of one of my horses, and on our departure from Multan, followed me with it to Karabagh, where having no further occasion for his services, I wished to discharge him. He however made such offers of unrequitable services, talked in Persian phrase of "spilling his blood at my stirrup," and detailed such a list of varied accomplishments he was the possessor of, (reading and writing not included,) that I was induced to keep him on. To one of these accomplishments he knew I could bear witness, besides the cure of the horse; this was his causing loud explosions in water, by igniting a white powder on its surface, with a drop of liquid from a vial, much to the astonishment of the idlers of Multan.

At different subsequent periods, I gained from him the following abstract of his previous history:—

His previous History.

He was originally an inhabitant of Shiraz, the place of his birth, and was employed by Prince Hasan Alee Meerza, governor of Kirman. On the seizure of that prince by his elder brother Abbas Meerza, Agha Abbas fled, and travelled viâ Bamm, Narmasher, Seistan, Candahar and Cabool to Peshawur, where he met an old acquaintance, Naib Abdu Samad, who was raising an infantry regiment for Sirdar Sultan Mahommad Khan, and took service under him.

He afterwards accompanied the naib on his being obliged precipitately to leave Peshawur, on account of one of Sultan Mahommad Khan's brothers conceiving an enmity against him, to Cabool, where he became adjutant of the regiment Abdu Samad raised for Dost Mahommad Khan; and as such, was present in the action fought at Candahar on the 2nd July 1834, with Shah Shuja-ul-Mulk.

On his return to Cabool, he quarrelled with his patron and commandant on the subject of the uniform of the regiment, which he refused to wear, threw up his appointment in disgust, and retired from the service.

Quitting Cabool, he proceeded viâ Peshawur to Attock, where a display of his "*patakahs*," or crackers, procured him for a time employment with Cashmeeree Singh, one of the sons of Maharajah Runjeet Singh, whom he accompanied to Lahore, from which place he requested leave to return home to Persia, the value of his services not being fully appreciated, and I therefore, according to his account, encountered him on his road to Persia viâ Scinde.

From Karabagh we proceeded viâ Rawal Pindee to Attock. At this latter place, I planned and proposed to Agha Abbas this tour, which he agreed to attempt. Furnishing him with minute instructions, a small advance of money, a Persian writer and a guide, I dismissed him; and again separated from Captain Burnes and proceeded up the river Indus to explore the fords.

Tour proposed.

On my return to Peshawur from this trip, Agha Abbas, to my astonishment, again presented himself, with a doleful story of his two companions having deserted him at Rawal Pindee.

Threatened failure.

Leaving the choice of fresh men to his own discretion, and making him a further advance of money, I again dismissed him; and did not see or hear of him, until on the completion of his journey, he joined me at Candahar in the early part of 1838, with the following account of his labours and adventures, which has been translated, partly from his original account written by his companion from his own dictation; and partly from his answers to questions put by myself, on subjects he had at first either entirely omitted, or only slightly touched on.

Completion of Tour.

Nature of compilation.

N. B.—It must be borne in mind, that as only the four cardinal points of the compass are used as bearing: a "North" bearing has a range from "North-West" to "North-East," and in like manner the other three points.

Topography.

FORMAL

Preparation

On getting my dismissal from Major Leech, an advance of twenty-five Nanakshye rupees, and being furnished by Mr. Lord's native doctor with a number of small packages labelled in English, containing the commonest medicines, to enable me to act at times as a *hakeem*, I proceeded to organize my party. This consisted of myself, a

Party.

Persian writer, two guides, and a servant; all habited and equipped as fakeers

As some compensation for the disappointment felt by my employer at finding me at Peshawur, instead of hearing of me well on my journey, I subjoin the following information, gained during my detention at that city:—

Land estimate of Peshawur

Number of jarebs in the province of Peshawur according to the division of Sultan Mahmood of Ghuznee 15,76,000 jarebs, at the rate of 3,94,000 jarebs for each of the following four divisions; viz.

1st Division.—Yusafzyes, Bajour, Mandour, Chagharzyes, Byán.

2nd Division.—Teera, Bangash-i-Bala, Bangash-i-Paeen, Bannoo Daman, Khost, Murwat.

3rd Division —Khattak-i-Bala, Khattak-i-Paeen, Wazeeree, Toorees, Jajees.

4th Division —Khaleels, Momands, Daoodzyes, Khalisa-i-Shareefa, Duabah, Hashnagar, Baghayat-i-Bagram.

Revenue

The revenue of Peshawur under the Sadozye kings was 9,51,000 rupees, 2,40,000 of which was distributed in church lands to the Mullahs; and the remainder, 7,11,000 reached the royal treasury.

Number of Houses.

Peshawur is said to contain 7,761 houses, of this number 5,566 are private dwellings, and 2,195 shops

On the 7th of Jamadee-ussanee left Peshawur, and passing the Barah rivulet, reached Pabbee, a distance of 6 kos.

Akorah

8th Jamadee-ussanee.—Travelled eleven kos to Akorah, passing at five kos Nosherah, where there is a garrison of one hundred Sikhs, as well as at a Baolee, (well) on the road At Nosherah I witnessed an act of Sikh tyranny: three of the country people, Mahommadans, had been pressed to labour the day before, and at night had been shot on a pretended suspicion of being thieves. Their bodies were hung

Sikh tyranny

on a gallows, and a fire had evidently been lit underneath, from the dreadful manner in which they were scorched.

9th Jamadee-ussanee.—Proceeded to Attock five kos through the Gidar galee (jackall defile) and across the river Indus; saw the body of a Khatak, suspended over the gate of the town of Khyrabad, which is opposite to that of Attock, and on the right bank, in company with a dog, and scorched like the body at Nosherah. He had been killed by a Sikh on some false pretence. I also witnessed the wreck of two boats when crossing the river: they contained a wedding party, who were conveying a bride to her husband; four men of the crew alone escaped. I remained four days at Attock.

Another act of tyranny.

Wreck on the Indus.

13th Jamadee-ussanee.—Reached Haidaro (Hazro,) a distance of eight kos, passing at three kos the village of Daman, and at three and a half kos, that of Furmulliyan. There is a noted robber in these parts, by name Sher Zaman, who lives in the Gungar hills. He is in rebellion against the Sikhs, and one of their most deadly enemies. He seldom plunders a caffila unless he finds a Sikh in it, a single soul of which caste he never spares.

Haidaro.

Famous Robber.

15th Jamadee-ussanee.—Proceeded four kos to Burhan, crossing the Haro river.

16th Jamadee-ussanee.—Travelled three kos to Phattargad, a dependency of Hasan Abdal. There are one hundred houses on the mound, and fifty below. There are two Hindoo shops. The inhabitants have large herds and flocks, and are of the tribe of Gujar. Their supply of water is half kos distant, where there is a water mill, and forty or fifty trees. The head of the village, Malik Raheemdad. In the evening I was prevented from sleeping in the mosque, and had to content myself with the roof of the mill. I could only account for this inhospitality by supposing, that my wearing my mustachios untrimmed, betrayed me as a Sheeah. To the west is the district of Futteh Jung.

Phattargad.

Inhospitality.

17th Jamadee-ussanee.—Reached Pindi Nousheree, a distance of seven kos over a bad road, intercepted by ravines. There are 150 houses. The inhabitants are chiefly weavers of coarse cotton and woollen cloths. Their cultivation de-

Nousheree

pends on the rains. The head of the place is Malik Ghulam Rasool, by tribe a Kàtar. The governor, a Sikh, by name Mán Singh, had that day forced the daughter of a Musselman goldsmith. The inhabitants rose and took to arms, killed one of Mán Singh's attendants, and severely beat the governor himself, forcing him to flee, and then took away their families to the hills, as did all the neighbouring villagers, coming down at night and watching their fields and houses, armed. The village was so deserted, that I did not think it safe to put up in the mosque, but spent the night with one of these armed parties in a house in the purlieus. I afterwards heard that the outrage here mentioned was brought to the knowledge of Runjeet Singh, but I know not whether the aggrieved obtained redress or not.

Sikh tyranny.

18th Jamadee-ussanee.—Made a stage of eight kos, over a road much broken with ascents and descents, and ravines. Tahlan, a place consisting of seventy houses, and containing two Hindoos shops; fourteen Cashmeer dancing boys had also taken up their residence here. The name of the head man is Allanoor, by tribe a Jat. This place is dependent on Rawul Pindee. I spent the night with the Cashmeerees.

Tahlan.

19th Jamadee-ussanee.—Proceeded seven kos over ascents and descents, and through ravines and jungle, in which I lost my road, and had to wait at a tank, until a herdsman coming to water his cattle, set me right to Talan, a village on a rising ground, containing two hundred houses, fifteen Hindoo shops, and four of shoemakers. The inhabitants are weavers of coarse cotton and woollen cloths, and pay a revenue of 1000 rupees. There are eight wells. The name of the head man is Nasarulla. Here I was detained two nights on account of the indisposition of the Persian writer.

Talan.

21st Jamadee-ussanee.—Three kos to Chotra, which is a place containing 300 houses of Musselmans, and forty of Hindoos, situated partly on an eminence, and partly on the bank of the river Sawan. There are forty weavers, partly Cashmeerians and partly natives of Patwar. The revenue is 1,200 rupees. The river is very deep, and not used in cultivation, which is carried on by means of forty wells. There are two head men named Habo khan, by tribe a Budhar,

Chotra.

River Sawan.

and Shamee Khan, by tribe an Awan. There are no shops; the Hindoos transact business in their houses. One of my party going to make a purchase, entered into a quarrel with a Sikh, and came home wounded.

Bher.

22nd Jamadee-ussanee.—Travelled nine kos to Bher, a place containing seventy houses, but no shops. The road uneven. The name of the head man Habeebulla, by tribe a Ratyal. Revenue 200 rupees.

Doulatana.

23rd Jamadee-ussanee.—Proceeded three kos to Doulatana, a place containing two hundred houses of Musselmans and eighty of Hindoos: seven shops and three weavers. Revenue 600 Rupees. The inhabitants are of the caste Alpyals, and the head men are Kareemdeen, Nizamodeen, and Walee Mahommed.

Kamtareela.

24th Jamadee-ussanee.—Travelled six kos over bad ravines to Kamtareela, containing two hundred houses, eight Hindoo shops and twenty weavers. The place however is much dilapidated. Its revenue is 1000 rupees. The cultivation depends on the rain. There are two dilapidated mosques in the suburbs. The head man is Hadayatulla, by tribe an Awan. At this place my fakeer's habiliments attracted charity.

Peer Janjoot.

25th Jamadee-ussanee.—Travelled five kos to Peer Janjoot, containing two houses of Mullahs, styled "Myan," three shops of Hindoos, and twenty houses of weavers, cotton cleaners, and gardeners. The "Myans" farm the place for a yearly nazarana of two hundread rupees. This is a neat, pleasantly situated place surrounded by trees, and having a fine tank stocked with fish. I stopped here another day, and my appearance attracted suspicion of my being an alchymist: many would-be smatterers in the art came to prove me, and fortunately, I found them more ignorant on the subject than myself; as I had not, when first asked, wisely denied all acquaintance with it. One man more foolish than the rest, catching at some dark hint I purposely let drop to confuse them, followed me a whole stage, intreating me to impart something of my invaluable secret to him. This I faithfully promised to do on my return, which I pretended would be very speedy.

Alchemy.

Dumbêlee.

27th Jamadee-ussanee.—Proceeded six kos, passing for three kos over estony pass to Dumbelee, a village situated on an eminence, and containing five hundred houses, and a new bazar of one hundred shops, laid out in two streets, at right angles to and intersecting each other, the residence of Rajah Fazldad Khan, who is by tribe a Bagyal. There are eight wells with Persian wheels, and the revenue is one thousand rupees.

Rotas.

28th Jamadee-ussanee.—Travelled five kos to Rotas, the head man of which place is Fazdlad Khan, by caste a Bagyal. He formerly furnished a contingent of 500 horse; and enjoyed the whole of Rotas, now under the rule of Rajah Gulab Sing. He enjoys 7,000 rupees, 1300 from Dumbelee and 5,700 rupees from other districts, and has no power. He has now retired to Dumbelee, where he resides. Rotas contains one thousand houses, and one hundred shops; has twelve gates, three to the East, five to the West, two to the North and two to the South: four of which alone are open. The district of Rotas is divided into fourteen tappas, one of which, Taliyala, under Waleedad Khan, is in jagire to Shah Zadah Karak Singh; one Shah Jahenee, under Shah Ahmed to Mishur Jesah, keeper of the royal toshakhanah; and the remaining twelve are in jagire to Rajah Gulab Singh. The revenue of Rotas was formerly three lakhs of rupees, now it only amounts to one lakh.

Twelve Tappas.

The twelve tappas of Rajah Gulab Singh are as follows: 1st. Tappa Shakra, under Choudree Ghulam Husen, by caste a Gujar; 2nd. Tappa Salama, under Abdulla Khan Gujar; 3rd. Tappa Doulatalee, under Azeemulla Khan Bagyal; 4th. Tappa Sikandar, under Azeemulla and Imam Bakhsh Bagyal; 5th. Tappa Choutlee, under Walo Khan Malyar; 6th. Tappa Rajoo, under Choudree Suleman Gujar; 7th. Tappa Sangoee, under Mahdee Khan Bagyal; 8th, Tappa Tirhala, under Fazaldad Khan Bagyal; 9th. Tappa Shibalee, under Mado Khan Bagyal; 10th. Tappa Eesyala, under Khuda Bakhsh, and Khuda Yar Jat; 11th. Tappa Kunar, under Lal Beg and Meerza Khan Moghuls; 12th. Tappa Pidree, under Yoosaf Khan Bagyal.

Sangoee.

29th Jamadee-ussanee.—Travelled six kos to Sangoee, passing half way a river, the remaining half over sand through cultivation. The place contains six hundred houses and seventeen shops of Hindoos. Here Mishur Jesah has built a fine upper-storied house for his own accommodation. Outside the village, to the North, is a fort with four towers, garrisoned by twelve of Rajah Gulab

Singh's sepoys. There are eight wells. The head men are Khuda Bukhsh and Khuda Yar, by tribe Bagyals. The revenue is two thousand rupees.

Koohar.

1st Rajab.—Proceeded seven kos over a plain, and through cultivation to Koohar, a place containing one thousand and five hundred houses and eighty shops. Within town to the South is a small mud fort that commands it, garrisoned by eight sepoys. There are twenty wells. The head man is Noor Alam Khan, a Kutubshye Awan. The revenue formerly was 2,500 rupees; it is now 8,000 rupees.

Prescription.

On arriving I put up in the mosque, where soon after Noor Alam Khan and his son came to prayers. Observing an excrescence on the temple of the latter, I offered my services to remove it. This was done in a few hours after the application of a liquid I had with me. For this piece of service, Noor Alam invited me to his house and entertained me; gave one of my men a white shalakee, and on my departure, packed up two days' provisions for me. I learnt that Noor Alam had once embroiled himself with the Sikhs, by killing one of the garrison for some act of tyranny committed.

Kotala.

3rd Rajab.—Travelled ten kos to Kotala, over a hilly road for four kos and through a defile. There is a tank on the hilly ground. The road is then sandy, and abounding in ravines. To the West is the town of Guzerat. There are eighty four villages dependent on Kotala. The revenue is 5,000 rupees. There are two thousand and five hundred houses. The old bazar contains two hundred shops; and the new one, which has been laid out in two lines intersecting each other at right angles, seventy shops. There are sixty-seven wells for cultivation. The head man is Abdulla Khan, by cast a Gujar.

Rasoolnagar.

4th Rajab.—Proceeded five kos to Rasoolnagar, called by the Sikhs Ramnagar, crossing the Chenab. The town is surrounded by a mud wall, and has six gates, and a garrison of fifty men, whose yearly pay is 300 rupees; but they are only paid for ten months. The government of the place is entrusted to Jawahar Singh, who receives on account of pay from the amount of the farm of the thanadaree and adalat 1,900 rupees; the whole amount being 2,500 rupees; he is a native of Ramnagar. The other taxes of the place are collected by Rajah Gulab Singh. The town contains eight thousand houses chiefly of mud, and six hundred and fifty shops, seventeen mosques, and fifteen dhurmsalas and thakoor divalas. There were formerly eighty-four villages dependent on Rasoolnagar, that are now given away in separate jagires. There are eighty-four wells for cultivation, which are all distributed in jagires to Brahmins. The inhabitants are Musselmans. The revenue formerly was three lakhs of rupees. The former chief of this place was Ghulam Kadar Khan, by tribe a Chatha. He has now taken up his abode in Ramkee, and has employment in Runjeet Singh's gorchars, on a salary of 400 rupees. When chief, he could collect several thousand men, and has often opposed Runjeet Singh and his father in the field.

Former Chief.

Here my funds ran short, and the Persian writer and cossid became clamorous for pay. Knowing that a man of my employer's, by name Nursing, was at Umritsir on a tour, having similar objects to my own; I set out for that city, promising to return in nine days. On my arrival at Umritsir, my application to Nursing proved unsuccessful; but I fortunately encountered some Persian and Cabool acquaintances; one of them, by name Agha Rajab Alee Khan, lent me 280 rupees, and paid for 45 rupees worth of pedlery that I bought for my journey, and I set off on my return, accompanied by my creditor's uncle, who was to be repaid at Cabool. On my return to Rasoolnagar, having overstayed my time by two days, I found that the Persian writer, tired of waiting, had disappeared with my notes. I lost no time in following him by double marches; on arriving at Koohar, I found he had left the preceding night; here I was no longer able to follow him on foot. Alam Khan lent me a horse and a guide, for which I presented him with a looking glass. On arriving at Rotas, I found the Meerza in the mosque. After a deal of coaxing, I induced him to return with me to Koohar, where I paid all my companions their wages, and got them to accompany me further on my journey.

Diversion to Umritsir.

Disappearance of Meerza.

21st Rajab.—Started for Khurd Chotala, arriving in three kos at the river Jelam. The place contains two hundred houses and eight wells for cultivation. The inhabitants

Khurd Chotala.

are Moghuls and Jats; the head man is Akir Khan Moghul. This stage was five kos. The revenue is 800 rupees including the district of Jalalpoor.

Jalalpoor.

22nd Rajab.—Proceeded eight kos to Jalalpoor, which is situated on the side of a hill, below which runs the river. It contains two thousand houses and seventy shops, and has fifteen wells for cultivation. In the town is a small mud fort with four bastions, garrisoned by ten men of Rajah Gulab Singh. Revenue 16,000 rupees. The head man is Sher Khan, by caste a Janjooa.

Chaki Hameed.

23rd Rajab.—Travelled ten kos to Chaki Hameed, passing Sherpoor at three kos. The place contains two hundred houses and two shops. There are fifteen wells for cultivation. The revenue is 1,500 rupees, including the district of Pind Dadan Khan; the head man is Rajah Futteh Khan, by caste a Jalab. On arriving at the place, the Rajah was seated in a *takya*, and conversation ensued, in which he enquired my native town, and on learning it, invited me to his house, where he entertained me, and produced spirits in the course of the evening on account of my successfully prescribing for his son's and sister's excrescences; he detained me as his guest three days.

Pind Dadan Khan.

27th Rajab.—Travelled to Pind Dadan Khan, which consists of three divisions, distant from each other from two to three hundred yards; one of which only is properly called Pind Dadan Khan; it contains three thousand houses and three bazars of about three hundred shops. There are three gates to the town, but the surrounding wall is so dilapidated, that there are thoroughfares in all directions. Outside of the town to the west, is a mud fort with four bastions, in which there is stabling for thirty of Rajah Gulab Singh's horses, and a garrison of thirty sepoys under one Takurdass. There is also a small iron gun outside the fort. There were thirty or forty heaps of salt, containing about 5,00,000 maunds, covered with a coating of mud to render them water proof. There is a large steel-yard here for weighing the salt, which is allowed to be sold no where else. The other division or suburb is called Kot-i-Sultan, containing five hundred houses, and a bazar of fifty shops. There are two gates, one to the north,

Kot-i-Sultan.

and the other to the south, and the place is surrounded by gardens. The name of the other division or suburb is Kot-i-Sahib Khan, under a man of that name. It contains six hundred houses, and a bazar of forty shops, but no gates, and there are thoroughfares on all sides. There are fifty wells for cultivation, twenty of which alone are in repair. The price of grain, &c. I found as follows: wheat six seers the rupee, ghee two and a half seers, oil eight seers, rice sixteen seers, mash one maund, cotton four and a half seers, barley twenty seers. All the timber brought down by the river in the flood, is considered government property. The chiefs are Rajah Zabardast Khan, Sahib Khan and Disher Khan, by tribe Gogids. The place is bounded on the north by the salt range, on the south by the river Jelum. The revenue, besides the six tappas, amounts to 35,000 rupees. The six Tappas are as follow:—

Kot-i-Sahib Khan.

1st. Tappa-i-Pind Dadan Khan, generally known as Tappa-i-Jalab, under Ahmed Khan. Revenue 20,000 rupees.

Six Tappas.

2nd. Tappa Ahmadabad, under Zulfkar Khan. Revenue 60,000 rupees.

3rd. Tappa Myanee, under Mahammad Khan, by tribe a Jat. Revenue 25,000 rupees.

4th. Tappa Pahra, under Noor Khan Moghul now in exile. Revenue 80,000 rupees.

5th. Tappa Barah, under Rahmat Khan. Revenue 16,000 rupees.

6th. Tappa Dannee, under Mahommed Khan, by tribe a Babad. Revenue 100,000 rupees.

There are in all eight salt-mines; four only are worked: the names of those that are shut are as follow: Sardee, Neelawan, Durnala, Chotana. The latter is said to contain veins of copper and lead. The inhabitants of the neighbourhood subsist by cultivation. The reason of the closing of the four mines is on account of there not being a sufficient demand for the produce. The rate at the four mines that are at work is the same. Sepoys of Rajah Gulab Singh are stationed over the mines, to prevent the smuggling of salt, which, to any extent is punished by confiscation of property. In consequence of the heavy fines, the miners themselves live on bread without salt. The government employ fakeers as spies, to try by begging, to discover the miners,

Salt Mines.

Smuggling.

who use salt in their bread. If the miners are found stealing a seer or two, they are obliged to extract twelve *goonees* of salt for one rupee, each *goonee* containing two and a half maunds. The government pay one rupee nominally for sixteen maunds, which quantity weighs actually twenty maunds.

Hire of Carriage.

The hire of carriage to Pind Dadan Khan is 1 rupee per twenty maunds from all the mines, except the Makraj one, the hire from which is 1 rupee for sixteen maunds. The camels on which the salt is carried are all the property of Rajah Gulab Singh. The merchants, who make wholesale purchases, get the salt at 1½ rupee the maund, others pay 2 rupees. Formerly the tax on the salt amounted to 4 lakhs of rupees. After the visit of Captain Wade, the farm rose to 8 and 9 lakhs, afterwards to 12 lakhs, then to 14, at which I found it; as far as 25 lakhs are said to be realized. Rajah Gulab Singh has farmed the mines from Maharajah Runjeet Singh. The labourers, who carry the salt out from the mines, are paid 1, 2 and 3 annas the day. Formerly one miner and two labourers got paid by the day one rupee;—the labourers being mostly males and females, adult and children, and the miner's own family. None but the experienced miners of the place can dig the salt. The labourers, when the salt is dug, bring it out by the aid of lamps in baskets, which they carry on their heads. Their clothes are completely blackened. The miners told me an anecdote, which was this: During Captain Wade's visit to the mines, when he was in one of the large chambers, Rajah Gulab Singh, jealous of a close survey being made, ordered the miners to throw up salt from behind the visitor, so as to fall in showers from above about him, and then to get up a cry that the roof was falling in, so as to cause his speedy departure. This stratagem succeeded. The galleries are driven under ground to the length of several hundred yards. The four mines that are at work are Khur Chotana, Korah, Kerah, Makraj. The inhabitants of the neighbourhood of these mines do not cultivate; but depend on their labour in the mines. The salt of these mines appears perfectly inexhaustible. Each miner digs from fifteen to twenty maunds a day.

Salt Farm

Captain Wade.

Mines at work.

There are one hundred houses in the vicinity of the Chotana mine, and no cultivation : the head man is Ṡhamo Khan Janjooa.

.There is no cultivation at the Korah mine, and the houses are on an eminence. There is no water nearer than half kos, and that is rain water. The head man is Faizbakhsh, by tribe a Jalab. To the North is the Dannee Darra. There are two hundred stone huts in the neighbourhood of the Kerah mine; but no cultivation. They have none but rain water.

There are two hundred stone huts in the neighbourhood of the Makraj mine, and no cultivation. There are two running streams, one fresh and one salt. The head man is Karamdeen, by cast a Gogir.

Interior of mines.

I went to most of the mines myself. They have all one entrance each, the galleries run through red earth, and the salt lies in veins which the miners follow, until exhausted, when they proceed in a fresh direction ; some of the shafts are sunk so low, that they have come upon water ; other galleries proceed so high, that light is let in from the top of the ground. Many accidents, some fatal, occur, by the falling in of the roofs of the chambers.

Accidents.

While I was in one of the mines, a labourer's arm was broken by the fall of a block of salt, and a general rush, headed of course by myself, was made for the open air. I saw one miner, who had lost his right arm by an accident, digging with his left.

The galleries are so dark, narrow, and winding, and so numerous, that it is impossible to traverse them without a light and guide.

Beautiful effect.

The warmth of the mines is very oppressive, and the reflection of the labourers' lamps on the crystal roofs of the chamber has a very beautiful effect. The mines of Neelawan and Khur Chotata are the finest.

Tools.

The miners separate the blocks by picking round the two sides and bottom, and then detach it from the top by heavy blows. The blocks generally weigh four maunds. The chips are collected by women and children. The miner's tool is a pick, of about thirteen inches long, having a sharp point at one end, and the other end about three inches square, which serves as a hammer. It is furnished with a wooden handle about a guz long.

Rajah's Farm.

Rájah Guláb Singh, besides the farm of the salt mines, farms the following ferries and districts, for 10 lakhs of rupees. Ferries—Bawal, Hareea, Bed, Bhera, Khushab, Saeewal, Dhannee, Ahmadabad, Jalalpoor, Meeanee, Makhad.

The districts are—Jalab, Bhera, Chakar, Bher, Yar, Saeewal, Dhannee, Pathwar, Gandapoorwal, Dalwal.

Dalwal.

The village of Dalwal is situated on an eminence; and is the Jagire of Mishar Beleeram. It contains six hundred houses and ten shops. It was formerly included in the district of Janjooa. The Mishar has built here a fine-upper storied house for his own accommodation. There are eight wells for cultivation. In the road is the village of Badshapoor, the former chief of which place was Sher Khan.

Sardee.

The village of Sardee is situated on an eminence, and contains one hundred houses, under a chief, Abdulla Khan, by tribe an Awan. To the east is the fort of Dharee, built by Sardar Haree Singh, and used as a state prison. It is built on an eminence, and is very difficult of approach. Mahmood Khan Hazarah Wala died a prisoner in this fort, from starvation: his sole food for twenty-four hours, being half pao flour, and the same quantity of salt. From Pind Dadan Khan to Sardee is about forty-five kos.

State Prisoner.

Stay.

I passed one month in visiting these mines, and spent a good deal of money in trinkets, distributed to the head men of the different places. I also practised with success, in my profession of Hakeem; sometimes giving medicines, sometimes charms.

Kahar.

The village of Kahar is situated in the plain, and contains three hundred houses, and four shops; also four water mills, a fine stream, numerous trees, and the shrine of Shekh Buzurg. I have not seen a prettier place in the whole of Patwar, than this. There is a tank at the shrine, in and round which are to be seen numerous ducks and peacocks. The head man is Fatteh Khan, an Awan by tribe. The distance from Sardee to Kahar is four kos.

Bherpoor.

29th Shaban.—Proceeded six kos to Bherpoor, a place containing three hundred houses and no shops. The cultivation depends on the rain. The head men are Moghal and Samad, by tribe Awans. To the East is Kahar, to the West Thalla, to the North Pind Malik Amanat, and to the South the hills. Revenue 1,200 rupees.

1st Ramzan.—Travelled seven kos to Thalla, the jagire of Thanah Singh Malwee. The Thanedar is Danya Singh. The garrison is composed of forty Sepoys. It contains three thousand houses, one hundred and twenty shops, and thirty wells for cultivation : thirty-two villages are dependent on this place. The head men are Haiyat Khan and Mehr Khan, by tribe Awans. To the West is Thaman, to the North Awankaree, and to the South the hills. The revenue is 60,000 rupees.

Thalla.

2nd Ramzan.—Proceeded to Thaman, the jagire of Ram Singh of Bhakapoor, who is by tribe a Brahmin. There are one thousand houses, fifteen shops, and twenty wells for cultivation: two kos on the road is the village of Akowar. The head men are Mahammed Khan and Budha Khan. Three kos further on, is the village of Kufree. Thence three kos is the village of Sankowalee Thence two kos is Thaman. On arriving, I was taken violently ill. To the West is the river Sawan, to the North the districts of Gheb and Dhannee, and to the South the road to Baghan [Karabagh]. The revenue is 24,000 rupees.

Thaman.

3rd Ramzan.—Travelled six kos to Tarapa, on which eight other villages are dependent. There are four hundred houses, on an eminence, on the bank of the river Sawan. On the road are the villages of Koulee, Battan and Shah Mahammad Walee under Allaiyar Khan, by tribe a Sapkal. Revenue 14,000 rupees.

Tarapa.

4th Ramzan.—Proceeded to Makhad, four kos, over a hilly road and through ravines, and two kos through a sandy defile, which is sometimes flooded, and thus impassable for a time. The road is infested by Khatak robbers, who come from the other side of the river. There are seven Mouzas, dependent on Makhad, the revenue of which is 10,000 rupees ; and that of the village, custom-house, &c. the same sums. Of this Abdulla Khan receives eight hundred as pay. The houses are on an eminence overlooking the river Indus, and amount to three thousand. There are two hundred Hindoo's shops, and three gates to the village.

Makhad.

Release.

Hospitality.

Kot-i-Singhee.

and had us released, and our property restored; and taking us with him seven kos to Kot-i-Singee, entertained us three days, killing a sheep for us every day. Here we witnessed a peculiarity in Wazeeree hospitality. The sheep, when killed, is brought with all its eatable appurtenances and placed before the guest, the villagers assemble round, and every one helps himself to the pieces he likes, which are "*kababed*" [the breast always,] and the rest is put in a pot to boil. It was the 21st Shawal when I arrived at Kot-i-Singee. The number of fighting men is six thousand, who acknowledge no rule. The headman is Dilasa Khan, by tribe a Massaoodkhel Singee Wazeeree. To the east is the Gholaree Pass, to the west the hill, to the north Kaneeguram, and to the south Tak. There are nine blacksmith's shops, and three of Hindoos. There is a mud fort, containing four hundred mud houses and woollen tents. Dilassa Khan entrusted me with a letter to Capt. Burnes, and furnished me with a guide to Cohaut, who ran away after having accompanied me three kos. The inhabitants are enemies of the Tak people. Dilasa Khan is suspected, not without reason, of being in the pay of the Sikhs. During my stay, he pointed out an eminence on which Mr. Moorcroft promised to build a fort for him. The kindness he experienced from the above gentleman, would at any time incline him to serve the British Government.

Kot-i-Alee Khel.

Iron.

25th Shawal.—Proceeded seven kos to Kot-i-Aleekhel, passing often through water and jungle, and a Pass, which extends to Kaneeguram. The Aleekhels muster four thousand fighting men. To the east is Thattee, to the west Bamroo, to the north the Ahmadzyes, and to the south the Myanees. I put up in the mosque very tired; scarcely an hour had elapsed when a man presented himself, saying his son had a bad ball wound, and wanted me to attend him. Being tired and wanting a guide, I told him I had not now the requisite apparatus, but if he would send some men in charge of his son on with me to the next town, I would try my best. To this the man would not consent, and took his leave. The road was very bad, and everywhere were veins of iron, and signs of where it was being, or had been, worked.

Kaneeguram.

Concord.

River.

Peer karal.

Price of Iron.

Coal.

Iron.

26th Shawal.—Arrived at Kaneeguram, which is the capital of the Wuzeeree country. The cultivation is carried on by running streams. The inhabitants are Sayads, who are the spiritual fathers of the Wuzeerees. The houses are upper-storied, and amount to four hundred. There are two large towers for the protection of the town. There are thirty-two shops, as follow; viz. sixteen of Hindoos, seven blacksmiths and cutlers, three goldsmiths, two scabbard makers, and four dyers. The headmen are Durvesh Khan, Sarwar Khan, Mulook Khan, Abdukahman Khan, Raim Khan, and Noor Khan. The amount of fighting men is five hundred. The Sayads are farmers; the Wazeerees are independent, and are mostly herdsmen. They are at enmity with the neighbouring tribes, but internally united. To the east are the Khataks, to the west the Gholaree Pass, to the north Dour, and to the south Tak. The cultivation is not at all proportionate to the supply of water; the stream that runs to Tak has its rise here. To the west, in the Pass, is a very lofty and extensive black mountain, called Peer Karal, in which I was informed copper is to be found. Disputes between the neighbouring chiefs led to the mines of this mineral being closed. The people also believe in the existence here of stones impregnated with gold. I much wished to visit this mountain, but was prevented by the cold, and want of a guide. Throughout the hills iron abounds, and there must be no less than fifty or sixty manufactories. The price of unwrought iron is 3 rupees Mehrabee the pucka maund. In Tak the Wuzeerees sell the quantity for 4 and $4\frac{1}{4}$ rupees. Merchants purchase it from the Wuzeerees for $2\frac{3}{4}$ and 3 rupees. Beyond the Peer Karal hill, coal is found, which is called "Sang-i-momyie." The method of extracting the iron is as follows: A pit is dug, about three and half feet in diameter, and the same in depth, the top of which is closed with a perforated cover of clay: over this is spread a coat of charcoal, which is made in great quantities in the neighbouring hills; over this the stones containing the iron are heaped, being first broken small, and over them again charcoal is heaped; round this heap five or six bellows are applied. The iron falls through the perforated cover into the pit, from which it is extracted to be wrought before being sold. The iron in being wrought, loses three-quarters and five-eighths of its weight. This process is alone undertaken by blacksmiths. The Wazeerees are divided into four classes; viz. Masaoodzyes, Ahmadzyes, Aleezyes, Bahlolzyes. The headmen of the Ahmadzyes are Bano Khan, Shekh Bayo Khan, Painda Khan, Neko Khan, Kazim Khan, and Pasham Khan. The fighting men amount to four thousand. To the east they have the Khattaks, to the west the Masaoodzyes, to the north Khost and the Torees, and to the south Bannoo. The headmen of the Aleezyes are Mahommed Asan Khan, Durvesh Khan, Sarfraz Khan, Mahommed Khan, Sayad Shah, Mulla Ghaib Khan, Khudadad Khan, Tooran Khan, Wilayat Khan, Sarwar Khan, and Hatim Khan. They muster from four thousand to four thousand and five hundred fighting men. To the east they have Thattee, to the west Bannoo, to the north the Ahmadzyes, and to the south the Myanees.

Ahmadzyes.

Aleezyes.

The headmen of the Bahlolzyes are Nasrat Khan, Sair Khan, Salamat Khan, Deerut Khan, Bazzul Khan, Alee Mahommed Khan, Mulla Nadir Khan, Meer Allam Khan, Dost Khan and Gul Rez Khan. They mustered three thousand and five hundred fighting men. To the east they have the Admadzyes, to the west Kaneeguram, to the north Dour, and to the south Thattee.

Bahlolzyes.

29th Shawal.—Proceeded nine kos to Manzakee, over a hilly road, through a jungle. It is situated between two streams, and consists of forty houses; beyond the stream to the south, are other thirty houses. There is a water mill in play. The headman is Mushkeen Khan, by tribe a Shahookhel. Number of fighting men one hundred. They are at enmity with the people of Dour. I put up on arriving in a blacksmith's shop.

Manzakee.

1st Zeekadah.—Travelled seven kos to Kamsar over a hilly road, and through a jungle. On descending from one of these hills, I stopped for a short time on the borders of a stream, with the intention of taking some refreshment, when I observed a party of four men advancing towards me; fearing they might be thieves, I had recourse to my detonating powder, and placing some on a stone at my feet, awaited their approach, when they drew near, in attempting to rise. I rested my walking stick on the powder, exclaiming "Ya Allee maddat," (help! oh Allee.) The usual explosion ensued, and the thieves, for such I still suspect them to have been, ap-

Thieves.

proached me with great reverence, and requested that I would bless them by clapping them on the back. The head man of Kamsar is Noor Khan. The number of fighting men is eighty. They are at enmity with the people of Dour. The place is surrounded by hills, and is itself situated on an eminence. There are three Hindoo shops. On arriving I put up at the *mehman khanah,* and introduced myself. They brought a bed for me, on which I seated myself. They then asked me if I had dined, I replied that I had now entered their country, (a hint that I depended on their hospitality,) one of them immediately rose, and brought some rice and butter milk. While I was dining, a Hindoo presented himself, and complained that he had a wife, who had presented him with three children, but was dumb; I suggested, that she must be possessed of a devil. He insisted on my accompanying him home. This I did, saying that I would put a copper pice and a rupee into a vessel of water, and that one or the other would leap out; if the former, he must distribute a fowl and some copper change in charity; if the latter, a sheep. A vessel being produced, I proceeded, with the aid of my servant, to discolour the water, in order to conceal the contents which consisted of a steel spring, confined by means of a piece of rock salt, on which I placed the rupee during my incantations. The salt of course in time melted, and the spring expanding, jerked the rupee out of the water. The sheep was accordingly given me to sacrifice, as well as the charmed rupee; and in return, I gave the dumb lady a looking glass, in which she was punctually to look at herself, whenever threatened with a return of the dumb devil, which I assured them would either quit her after seven days, or seven weeks.

Dumb Woman.

Jugglery.

3rd Zeekadah.—Proceeded to the valley of Dour, which is embosomed in hills. The cultivation is carried on by running streams. There are about one hundred, or one hundred and fifty different forts and villages in the valley. Three of the forts are large, the residences of the Malik. They are Thattee, Ismailkhel, and Hyderkhel.

Dour.

The headman of Thattee is Mahommed Khan, by tribe a Khattak. There are six hundred houses, and sixty-five Hindoo shops. The number of fighting men is one thousand. They are at enmity with the Wazeerees. To the east are the Hasankhels, to

Thattee.

the west, the Utmanzyes, to the north Khost, and to the south the Wazeerees.

Moosakhel.

The headman of the Moosakhels is Alee Khan. The fort of Moosakhel and suburb contain seven hundred houses, and one hundred Hindoo shops. From Thattee to Moosakhel is five kos. The number of fighting men is three thousand. They are at enmity with the Wazeerees. To the east are the Hasankhels, to the west the Utmanzyes, to the north Khost, and to the south the Wazeerees.

Hyderkhel.

The headman of the Hyderkhels is Kamal Khan. The town of Hyderkhel contains three hundred houses, and thirty-five Hindoo shops. The country between Moosakhel and Hyderkhel is particularly fertile and well watered. The distance is six kos. There are two Sayads here, who are much looked up to. They are Furmals of Kaneeguram; their names are Jawaher Shah and Ghareeb Shah. All disputes are settled in their presence, and they draw no contemptible revenue from the district. In every field in the valley, there is a tower built for its defence. They are much divided among themselves. The fighting men amount to two thousand. They are friends with the men of Khost and Bannoo, and enemies of the Wazeerees.

Discord.

Peculiar Habit.

There is a peculiar tribe in the hills of Dour, that shave one eye-brow, one mustache, and half the beard; and apply antimony with the finger above and below the eye, so as perfectly to disfigure their faces. The men of Dour assemble once a week, at an entertainment got up by subscription: every one attended by his catamite boy, and during the repast, the most disgusting attentions are paid to them, and most revolting caresses received from them. To the east are the Hasankhels, to the west the Utmanzyes, to the north Khost, and to the south the Wazeerees. The people of Dour are perfectly independent. The distance from Moosakhel is six kos.

Disgusting Custom.

Usmankhel.

20th Zeekadah.—Proceeded eight kos to Usmankhel, which is a dependency of Khost. The inhabitants who are robbers, live in hair tents, which are thirty in number. They pay no revenue. They are migratory. The road to this place is difficult and hilly.

21st Zeekadah.—Proceeded twelve kos to Khost, having procured a guide over a difficult hilly road. The cultivation is carried on by running streams; but on account of the unquiet state of the neighbourhood, half the land is waste. There are three hundred and fifty houses, and thirty-five shops, The headman is Sahibzadah Ahmed Shah, [a holy character,] a descendant of Peer Dastgeer, Shakar Khan, Nooradeen Khan, Ismail Khan and Abdulla Khan. The fighting men amount to five thousand. They are at enmity with the Wazeerees. They are ryots of Dost Mahommed Khan of Cabool. To the east are the Wazeerees, to the west the hills and the Jadrans, to the north the Toorees and the road to Kuram, and to the south the Thattee hills. The revenue amounts to 30,000 rupees, of this sum 5,000 rupees are distributed to the Maliks, the remainder is given in jaghire to Alladad Khan, the son of Sarwar Khan of Tak, who sought refuge at Cabool, on losing his possessions; and to whose son, Dost Mahommed gave a daughter in marriage. I presented the Sahibzadah with a penknife and a pair of scissors, and he in return furnished me with a guide.

Khost.

Holy Character.

Dost Mahommed.

25th Zeekadah.—Return to Usmankhel, and retracing my steps via Hyderkhel, on the 27th Zeekadah arrived at a town on the boundary of Bannoo, the headman of which place is Dilasa Khan, surnamed the Ghazee.

The district of Bannoo is flat, and fertilized by running streams, partly from one which comes from Dour, and partly from the Kuram river. The district is highly cultivated. There are full four hundred, if not five hundred forts and villages in the district. The district is divided into four tappas, or rather five; viz. Eesakee, Meeree, Suryanee, Khamsee, and Chandookhel.

Bannoo.

The headman of Eesakee is Dakas Khan, and it is again subdivided into four tappas. The fighting men amount to four thousand. The revenue amounts to 22,500 rupees. The four tappas are Loongarkhel, under Dakas Khan; Nukradeenkhel, ditto ditto; Siknadarkhel, ditto ditto; and Shamseekhel, under Kalandar Khan, who resides at Kalandarkhel. Dakas Khan resides at Bazar, which is the capital of Bannoo. It contains five hundred houses, and eighty Hindoo shops, five dyers, and five blacksmiths. This place is

Eesakee.

Bazar.

called Bazar, because all the inhabitants of Bannoo come here to market

Meeree.

The headman of Meeree is Meer Baz Khan It is sub-divided into six tappas. The fighting men amount to 3,000, and the revenue to 30,000 rupees. The six tappas are:—

Kakee, under Shahbaz Khan. ; Obad, ditto ditto; Hasankhel and Mamookhel, under Hyder Khan ; Naswarkhel under Ghazee Khan and Ameer Khan ; Sarkee under Meer Baz Khan ; and Mandyoo under Alam Khan.

Suryanee.

The hoadmen of Suryanee is Dilasa Khan Ghazee. It is sub-divided into five tappas. The fighting men amount to three thousand, and the revenue to 25,000 rupees.

The five tappas are :—

Daood Shah, under Dilasa Khan Ghazee; Mandahkhel, under Bazeed Khan and Meer Kalam Khan ; Walakdeenkhel, under Zapt Khan ; Ghazeekhel, under Zahar Khan; and Hek-mis-kee, under Sekandar Khan.

Shamsee.

The headmen of Shamsee are Jangee Khan, Meerash Khan, and Jafar Khan. The fighting men amount to two thousand, and the revenue to 22,500 rupees. It is sub-divided into four and half tappas, as follow :—

Barkhajaree-Sarkhajaree, under Janghee Khan and Jafar Khan ; Ismailkhel and Meerakhel, under Sirdar Khidr Khan ; Waleekhel and Sikandarkhel, under Meer Wais Khan ; and Daree-Deeree, under Namwar Khan and Gada Khan.

The half tappa Meetakhel and Fattehkhel, under Sirdar Ameer Khan.

Chandoohkelan.

Refuge,

The chief of the Chandookhelan is Sirdar Sher Mast Khan, noted throughout Bannoo for his hospitality. Ahmed Khan, the ex-chief of the Eesakhels, has sought refuge here. Dakas Khan is, however, the chief of the greatest note in Bannoo. The number of fighting men is four thousand. This district is much deserted, on account of the Sikhs levying three-sixteenths of the produce as revenue.

The cultivation of the district consists of turmeric, sugar-cane, rice, cotton, wheat, barley, and juwaree

The inhabitants of Bannoo, denominated Bannoowals, are friends with the people of Dour, and enemies of the Wazeerees. They have also, to a great extent, feuds among themselves; and are ryots of Runjeet Singh, but very unsteady ones; and their revenue is generally collected by large detachments. To the east and north are the Khattaks, to the west the Wazeerees and Dour, and to the south the Murwats.

I remained on the boundary of Bannoo two days, and at Chandookhel three days; the distance between the places being five kos.

Umarkhel.

2nd Zeehijjah.—From Zakookhel Chandookhelan, proceeded eight kos to Umarkhel, a dependency of Murwat, over a sandy road, with the exception of the two first kos. The place contains thirty mat huts; their drinking water is two kos distant. The cultivation depends on rain. Each house subscribes a vessel for the mosque and for strangers.

Lakkee.

3rd Zeehijjah.—Proceeded to Murwat to the village of Lakkee. The cultivation depends on the rain. This is the principal town of Murwat. A small portion of the Kuram river is applied to cultivation. There are three tribes of Murwats.

Bahram.

Bahram, under Feroz Khan and Muhablat Khan, resident of Ghuzneekhel; amount of fighting men two thousand.

Dreplarah, under Noora Khan and Allaiyar Khan, resident of Sangookhel and Asakkhel; amount of fighting men two thousand.

Moosakhel, under Hyder Khan, resident of Adamzye, and Cashmeer Khan, resident of Walee; amount of fighting men one thousand and five hundred.

Revenue.

The former amount of the revenue of Murwat, in the time of the Sadozyes, was 18,000 rupees, and in the time of the Nawabs of Dera, 50,000 rupees.

Lakkee.

The town of Lakkee is situated in the division of Bahram; but the whole three divisions dispute about their claims to it. The Maliks of Lakkee are four in number; viz. Deewana Khan, Gouhar Khan, Jahan Khan, and Alam Khan. The town of Lakkee is composed of four hundred houses and twenty shops, three dyers, and two blacksmiths. They are now ryots of Runjeet Singh, but compulsory ones, and their revenue is only collected by detatchments of Sikh troops. They are friends of the Bannoowals, and enemies of the Wazeerees.

Lachee Teeree.

Proceeded on leaving Lakkee to Lachee Teeree, a dependency of Cohaut, under the rule of Runjeet Singh, a jaghire

On arriving at Makhad, two men of Rajah Suchet Singh's came to demand two boats for crossing the troops,—in which, towards evening, I embarked with them. Gouhar Singh, of Pind Malik Amanat, with forty sepoys, kept guard on one of the gates of Makhud. The head man is Abdulla Khan, an Afghan, of the tribe of Saghuree, who can muster four thousand fighting men.

Karabagh.

5th Ramzan.—Proceeded by water to Karabagh, which consists of a fort and a suburb, situated at the foot of the salt range. There are three thousand houses and three bazars, containing one hundred shops. On the hills are two towers, which command the town, under Allaiyar Khan. The revenue derived from the salt is appropriated by Rajah Suchet Singh. There are twelve saltpetre manufactories, the amount of the revenue from which is 12,000 rupees; which is given in jagire to Malik Allaiyar Khan, by tribe a Satkal Awan. He could collect one thousand five hundred fighting men. They are friends with the men of Teeree and Sagharee, and enemies of the Khataks. To the East is Saeewal, to the West Eesakhel, to the North Shakar Darra, and to the South the river Indus. The revenue paid to the Sikhs is 5000 rupees, ten horses, and twenty camels. Rajah Suchet Sing's force had proceeded to Katkee, a fort of Ahmad Khan, situated in a valley. The Khan, on hearing of the advance of the Sikh force, fled, and sought refuge in Bannoo Daman. The Rajah, finding the place vacated, returned, and took possession of the fort of Eesakhel.

Saltpetre.

Revenue.

Meerza deserts.

I intended proceeding hence by water to Dera Ismail Khan, and thence to Tak by land; the Meerza became aware of this intention, and not liking to accompany me, left at night, and proceeded, I supposed, via Shakar Darra and Cohaut, to his home at Peshawar. I was much annoyed and distressed at his disappearance, until I was fortunate in procuring another writer, an Afghan, in whose company I marched, with the Sikh force, towards Dera Ismail Khan. I remained three days at Karabagh, alias Baghan. During this time news reached the Rajah, that Alladad Khan, the son of Sarwar Khan, joined by the Wazeerees, had advanced on Tak; and that the Sikh garrison, leaving the fort, prepared for the attack, which proved successful, and the Sikhs suffered a signal defeat. The town was taken and

Insurrection.

plundered, and finally evacuated, as the people of Tak would afford no assistance to Alladad Khan and his Wazeeree allies. On receiving the intelligence, Rajah Suchet Singh, instead of proceeding to Bannoo Daman after Ahmad Khan, turned off to Tak, having sent for the two guns he had left at Karabagh. On arriving within one march of Tak, the Rajah received confirmation of Alladad Khan having retired to the Wazeerees: he therefore fell back on Eesakhel.

9th Ramzan.—Reached Eesakhel, which is the name of a district; the village being called Zakokhel. It has a fort and seventy shops. The tribe could collect three thousand fighting men. The cultivation is carried on from the river. The chief is Ahmad Khan. To the east is the river Indus, to the west the Murwats, to the North Karabagh, and to the South Khusoor. They are friends with the Sawan Wazeerees. The revenue is 30,000 rupees.

Zakokhel.

10th Ramzan.—Proceeded to Umarkhel on the road past Bandah Saiyadan,—a collection of wooden and thatched houses.

Umarkhel.

At one kos beyond this, the Kuram river falls into the Indus. I forded the former, which in some places is knee, and in others waist deep. On the other side of the river is a quick-sand; on one side are the hills and the road to Kot-i-kafiree, which is so narrow, that only one horseman can pass at a time. The Sikh force and guns were at Kot-i-kafiree.

Kuram River.

An Afghan chief, by name Shah Walee Khan, a Nyaze, was accompanying the Rajah: he was a brave man, and had performed good service. Suchet Singh however, got suspicious and afraid of him, and under pretence of getting him to look out for a gun road, sent him with a party of Sikhs, who, in compliance with their secret orders, murdered him on the road, as he was saying prayers, having dismounted for a time for that purpose. The Rajah then set out for Tak, by the Kuram valley. News was brought that the Khan had been killed by the Afghan Ghazees, who were in rebellion against the Sikhs, and prowling about. The Rajah, in great apparent distress at the intelligence, ordered the body immediately to be sent for, and buried. There are two forts at Kot-i-kafiree, both in ruins; one below, and one on the hill: from one kos beyond the hill, Umarkot becomes visible. The place consists of about a hundred houses, and two Hindoo

Murder of an adherent.

Kot-i-kafiree.

shops, situated beneath a hill. To the West is Dera Ismail Khan, to the East Eesakhel, to the North hills, and to the South the river Indus.

Khusoor.

11th Ramzan.—Proceeded seven kos to Khusoor, a place inhabited by Afghans, who muster one thousand fighting men, under Hassan Khan, by tribe a Khusoor. There are five hundred houses, and eight shops. The cultivation depends partly on the rain, and partly on the river. To the West are the hills, to the East the river Indus, to the North Eesakhel, and to the South Baloot-i-Hazrat-i-Shah Eesa. The revenue of Khusoor amounts to eight thousand rupees. The inhabitants are friends with the Murwats, and enemies of the Eesakhel.

Shah Baloot.

Two kos from Umarkhel is the shrine of Shah Baloot, the road to which place is through jungle, abounding with date trees. There is a gun road along the river. At the shrine there are many fine trees, and a tank, stocked with duck.

Dera Ismail Khan.

12th Ramzan.—Proceeded to Dera Ismail Khan, which place need not be described by me, as it was visited by Capt. Burnes, on his voyage up the Indus. I here met a servant of his proceeding to Bombay, in charge of a flock of sheep.

Bandah-i-Saiyadan.

13th Ramzan.—Proceeded four kos to Bandah-i-Saiyadan, over good level ground.

Kot.

14th Ramzan.—Travelled six kos to Kot, over a good level road without water.

Mandye.

15th Ramzan.—Proceeded seven kos to Mandye; sometimes over a level road, and at times over rising ground. The amount of fighting men in the neighbourhood is two thousand, under Gul Khan and Jahan Khan. There are seven hundred houses and fifty shops. The revenue is included in Karachee. To the west are the Suryanees, to the East Dera Ismail Khan, to the North the Murwats, and to the South the Myankhels. The inhabitants are Gandapoors, of the tribe Barakhel, who are enemies of the Suryanees. On arriving, I introduced myself to Jahan Khan. In the course of conversation, he expressed his desire to procure some white "kushtah" of copper. This I showed him how to make, much to his delight, and he gave my companions three coarse shalakees, one piece of karbas, one maund of raisins and jalghozas, and two seers of Candahar tobacco; which latter was a most acceptable present.

19th Ramzan.—Travelled six kos to Karachee, a place inhabited by Barakhels, amounting to six thousand fighting men. The place contains one thousand and five hundred houses and two hundred shops. There is a large grain exchange on Mandye here. There is a wall one and a half *guz* and high, round Karachee, through which there are numerous thoroughfares. There is a large tower in the town. The cultivation depends on the rain. The inhabitants are at enmity with the Suryanees, and reciprocal forays are constantly carried on. To the south toward the hills, are the Shekhans and Zarganees, and two hundred houses of fakeers, where the cultivation is carried on with running water. The headmen of Karachee are Alee Khan and Gul Mahammad Khan. To the east is Dera Ismail Khan, to the south the Myankhels, to the north Usturana, and to the west the hills. The revenue under the Sikhs is thirty thousand rupees. During my stay, the Sikhs wanted to increase it to 50,000 rupees. The above two headmen proceeded to Lahore, to lay a protest before the Maharajah. Two rupees a load is levied here from each merchant's camel. I had a letter of introduction to Alee Khan, from his younger brother Jahan Khan of Mandye. On my arrival at Karachee, Alee Khan came to see me, and treated me with great respect. After my interview with him was over, I took up my quarters in the mosque, where I tried to settle myself to sleep, not feeling inclined to eat from excessive fatigue. While my companions were satisfying their hunger, and I was yet awake, a man and woman presented themselves at the mosque door, wishing to see the fakeer that had arrived. On enquiring the cause of this untimely visit, the man informed me he had a young wife at home, possessed of a devil, which he entreated me to cast out. I promised to do all I could in the morning; they went home, and returned with an entertainment of bread, ghee and curoot. In the morning, the "Pesh Nimaz," or clerk and the people came to the mosque to prayers; I was kicked up out of my sleep, to join them. I arose, and made my ablutions; but not knowing the proper positions for the Sunnee ritual, I was very nervous. I however got through the ceremony, by copying faithfully the man who stood next me. After prayers, I was taken by my friend of the preceding night to his house, to cast out the devil. By this

Karachee.

Increase of Revenue.

Untimely visit.

Prayers.

time I had become known in the village, and the people came to me in crowds, especially women, some begging for charms to increase the attention of their husbands, others for charms to get them husbands,; upon others I spat, at their request, to cure cutaneous diseases. Towards evening, they brought me the woman possessed of the devil, whom I proceeded to cure, [God pardon me,] in the following manner: Wrapping up some of the detonating powder in a paper, I gave it to my servant to keep; then sending for the woman, and wrapping up in a piece of paper a small quantity of ashes in the presence of the people assembled, I gave it to my servant to give her, that she might deposit it in an old grave-yard for the night. I had of course before given orders to my man, to give the woman the detonating powder, instead of the ashes. The woman implicitly followed the instructions, and next morning returned with the paper, accompanied as usual, by many people. I then ordered the woman to place the ashes on a stone, and putting a rod of iron into her hand, directed her to watch a sign from me for striking the ashes: I then commenced vehement incantations, becoming very excited at times, until at the given signal, the ashes were struck, and a loud report, as of a matchlock, succeeded, when I ended by exclaiming, "I have shot the devil; now you are cured." The populace were astounded, and loaded me with their attentions. I remained three days at Karachee, and on my departure, presented the woman with a looking-glass I had purchased for two rupees, telling her to look at herself in it, whenever the devil felt again inclined to return. To the east of Karachee is Dera Ismail Khan, to the west the hills, to the north Usturana, and to the south Tak.

Casting out a Devil.

23rd Ramzan.—Proceeded seven kos to Rohree, a place containing eight hundred houses and three Hindoo shops. The fighting men amount to one thousand. The cultivation is carried on with running water. To the east is Dera Ismail Khan, to the west the Hills, to the north Karachee, and to the south Tak. The headman is Mahammad Raheem Khan, by tribe a Barakhel. The inhabitants are enemies of the Suryanees. The houses are in a fort, and the ruler distributes justice on a low platform outside. On arriving, he refused me entrance, and I put up at a running stream near at hand, and having cooked a pillau, invited the

Rohree.

governor to join us: upon this he insisted on my occupying a seat near him and partook of the fare, and in the evening sent me a "*lyaf*" or coverlid; under which, owing to its inhabitants, I got no rest.

Tak.

24th Ramzan.—Proceeded nine kos to Tak. The chief Alladad Khan, who was then an exile, is by tribe a Doulatkhel. In his late incursion, he burnt all the neighbouring villages. At Tak [i-Sarwar Khan] I found the following Sikh force; viz. Jemedar Mahommed Hashan, and one hundred sowars, and five zambooraks. Chet Singh Kumedan with a like detachment. Lena Singh, with one hundred ghorahchars. Saidar Ram Sing, with a like number, one hundred other ghorahchars, dispersed in small bodies; six hundred infantry of the regiment of Futteh Singh Aloowala, one gun. Nadir Alee Khan, Baloch Khan, and Mayan Khan, with forty horse, besides other footmen.

Citadel.

There is a smaller fort within the fort of Tak, called Narinj Kilah, within which there are three wells: and inside the outer fort gate are seven guns and twenty-five zambooraks, all manned. Guns can be mounted on all the four bastions of the Narinj Kilah, to receive which, there are "damdamas." The breadth of the wall is four *guz*. There is an "alampana" or *fausse braie*, and a ditch, nine *guz* broad. There are two gates to the Narinj, one to the east near a garden, another to the west. There are seven gates to the outer fort, called respectively, Nourang, Peer Dastgeer, Hazrat Eesa, Sarbanan, Mooree, Panch Tanpak, aud Maranee. The fort is surrounded by gardens, around which again there is a wall having three gates. Three sides of the fort are surrounded by broken inaccessible ground. The only good approach is from the direction of Dera Ismail Khan. The Doulatkhels amount to two thousand fighting men, and are enemies of the Wazeerees. In the whole country of the Doulatkhels, there are two running streams; one called Tak, the other Kamal. To the east is Dera Ismail Khan, to the west Daraban, to the north the Myanees and Wazeerees, and to the south the Gandapoors. The road from this to Cabool is almost impassable, from fear of the Wuzeeree plunderers; the general road taken by the Luhanee and other merchants, is from Daraban. The cultivation is carried on by running streams. The

Gates.

Road to Cabool.

revenue in the time of Sarwar Khan, was 23,000 rupees. The produce no doubt amounted to 200,000. It now costs the Sikhs more than it is worth.

Value to the Sikhs.

The fort of Fattehgur is dependent on Tak, and is a very strong place, situated on an eminence. It belonged to Alladad Khan, who entrusted the command to Anayatulla Khan, one of his most trustworthy men. On the Sikhs gaining possession of Tak, this man surrendered his trust to them, and was again installed in the command. The fort is situated to the west of Tak, at the entrance of a valley. The inhabitants of the neighbourhood are Myanees. The fort is surrounded by a *fausse braye* and a ditch, nine *guz* wide; two of the bastions are fitted for bearing guns. There are two wells inside. The inhabitants do not amount to more than two hundred. To the east is Tak, to the west the Myanees, to the north the Gandapoors, and to the south the fort of Thattee.

Fattehgur.

5th Shawal.—Travelled six kos to Mameer, a place containing twenty-five houses, situated at the base of a hill. The inhabitants are all robbers. It is a dependency of Tak. These people act as guides to the Myanee and Wazeeree robbers, who make excursions into the Tak territory, and receive a share of the plunder. As the main road to Shinkee was impassable, being infested by thieves, I determined on going in company with my new Persian writer, a man of Alladad Khan's, and a guide procured from Mameer, by a hill bye-road to Bandah-i-Saiyadan, where I arrived on the 6th Shawal.—There is a shrine here of Shekh Kalamkar, and the Wazeerees bring offerings of wheat, and heap it on the ground, and no thief is bold enough to steal any of it. The Sayad alone, in times of scarcity, when they cannot procure it elsewhere, make indents on the store. The road is hilly, and for some distance through a defile. There are fifty houses of Sayads. On arriving, I put up in the mosque, where one of the Sayads brought a son of his to be cured of a cataract in the eye. This I promised to do, if he would allow his son to accompany me to Shingee, which he did. The length of the stage was seven kos.

Mameer.

Bandah-i-Saiyadan

Sacred Granary.

7th Shawal.—Proceeded six kos to Chandoulah, over hills through defiles, and crossing a stream that flows from Kaneeguram to Tak, at least twenty times. The place is

Chandoulah.

situated at the entrance of the Wazeeree valley, and contains about one hundred houses. I took up my quarters in the mosque as usual; my writer had an acquaintance here who entertained us. The hills abound with iron, that the people work and take to Kot-i-Singee.

Meeting with Robbers.

8th Shawal.—Set out with the intention of proceeding to Aleekhel. The road was through jungle, defiles, and over hills. On arriving at a stream I halted, and made preparations for cooking, when a party of six men, apparently robbers, presented themselves, and partook of the fare, and smoked our *chillums*. They then questioned us as to our homes, and the object of our journey. I replied, that we had come from Mecca, and were proceeding home to Baghdad. They then asked what we had with us. I replied we were poor Hajees, and had nothing but a few medicines. These they requested to see. On my complying with their request, the English writing on the packets attracted their attention, and demanded what the strange character was. I replied that they were marks of my own invention, and mere help to my memory, marking the different medicines. They became suspicious, and opening my bundle, extracted the articles that pleased them most, such as penknives and scissors. They then bound us and took us to Khel-i-Masaood, beating us all the way, and on our arrival, sent for the village Akund and shewed him the inscriptions. He immediately decided that we were Feringees, in which opinion the Akhund confirmed them also, on reading the notes of the road my Persian writer had. We were very badly treated during our captivity, which lasted twelve days, and were daily threatened with death. They endeavoured to make my companions give evidence against me, by beating them apart, and promising them freedom if they would confess. During their punishment, they would allow I was a Feringee, but when it ceased, declared only I was a fakeer. When we were alone, I warned my companions not to peach, as we should certainly all be killed. A man of Kheli Masdood went one day on an errand to Kot-i-Singee, the head-man of which place was Dilasa Khan, who on enquiring the news, was informed, that some Feringees had been discovered and confined in his village, and they were thinking of killing them. Dilasa Khan being a great friend of the late Mr. Moorcroft, on hearing this, immediately set out, and arrived where we were confined,

Discovery.

Captivity.

Mr. Moorcroft.

Salt mines.

of Sultain Mahommed Khan Barikzye. There are only four salt mines in the whole Khattak country: two in the district of Lachee, called Malgeen and Cheena, and two in that of Teeree; the salt from the latter is black and mixed with small pebbles. That of the Lachee mines is of a superior quality. The district of Lachee is farmed by Saidan Shah, for 22,000 rupees. In the district are included the mines, Ismailkhel, Meer Ahmadkhel, and Malgeen. The pay of Saidan Shah is five thousand rupees, and his jaghire is in Cohaut in the district of Sher Khan. He has in his employ twenty horsemen.

The mines of Chotara are known by the name of Maheekhel and Karz Kurooz, and are farmed by Shahbaz Khan, Akarkhel of Teeree, the capital of the Khattak country.

Salt.

The price of salt in Teeree and Chotara is twelve ass loads, or eight bullock loads for one rupee of the Sultan Mahommed Khan's coinage; ten pice is levied on every bullock load, and eight pice on an ass load; one pice the load is levied by the miner.

One-fourth of the government duties on Lachee salt is given in pay to Maliks Nadir and Bahadur, who superintend the whole districts of Khurm and Thattee. In the winter, Afghan merchants export thousands of camel loads of this salt to Cabool, Jelalabad, Peshawur, and Bajour.

Exportation.

The salt of Chotara is exported only to Bunoo, Khost, Murwat, and the Derajat.

Naptha.

The fighting men of Lachee amount to three thousand. Two kos from Lachee are three hillocks of yellow earth, in which are flat flakes of stone, which burn. There are also two springs of naptha.

Teeree, which is the capital of the Khattak country, has a fort with four bastions, which is situated on an eminence. It was repaired by Sirdar Attar Singh Aloowalya, who conquered Cohaut. The whole of the district of Teeree is managed by Shahbaz Khan, son of Sadullah Khan, Akorkhel, who has farmed it from Sultan Mahommed Khan, for 30,000 rupees. His own pay being 3,000. He furnishes one hundred and ten horsemen. There are three tappas dependent on Teeree; viz. Darra Barak, Chotara, and Shakar Darra. The fighting men of Teeree amount to three thousand.

The cultivation depends on the rain, and their drinking water is from a spring, which becomes brackish soon after issuing from the ground. The men and women here are all afflicted with the *goitre*, which they say, arises from the salt quality of the water.

Goitre.

The people all dress in red. They are gradually, under the rule of Shahbaz, beginning to reinhabit the suburbs of the repaired fort, called Narinj, which contains one hundred houses; the other old fort contains one hundred and fifty.

On arriving at Teeree, I put up in the mosque, when shortly after, a very good looking woman presented herself, bringing with her bread and halwah, which she presented to me. Then taking hold of my skirt, begged me to attend to her petition. This was to give her some charm, to attract the attentions of her husband, which had for the past six months been divided among his other wives, to her entire exclusion. I ordered the Persian writer to make out the necessary charm, and gave it to her, as well as a piece of sugar-candy, which I charmed by whetting it with my saliva, while I repeated supposed incantations over it. This she was to give her husband to eat. Whether he was pleased with the perhaps unusual attention and fondness of manner of his wife, or how it was, I know not; but she returned to me next morning, with a present of a sheep, much pleased with the effect of my charm.

Charm.

Success.

My fame for charms soon spread, and fearing that I should have hosts of female applicants, and that some of my charms might not prove so efficacious as the first, I was glad to take my departure.

On leaving Teeree, at the distance of three kos at the entrance of the Darra-i-Barak, is the ruined fort of Rajnagar, generally known as Shahbazar. It is of a square construction, situated on an eminence, and has a very large tank inside. The position is a very strong one. Coal is found in the Darra-i-Barak in the bed of the ravine, by digging. It is brought here by floods, and there is no bed of it. To the east of Rajnagar is the Lachee road and the Darra-i-Barrak, to the west the Darra-i-khattak, to the north the Khattaks, and to the south the Khattaks, Shakar Darra, and Baghan.

Rajnagar.

Coal.

Latamar.

Leaving Lakkee, I proceeded seven kos to Latamar; a dependency of Chotara, over a bad road, without water. The headman is Daraz Khan.

Karak.

From Latamar I proceeded seven kos to Karak, over hills and through defiles; drinking water is procured from a spring, which turns brackish at three or four paces from where it leaves the ground. The headmen are Sangee Khan, Danial, and Darab Khan. This place is pleasantly situated in a valley. On arriving, I put up as usual at the mosque, when two men, father and son, presented themselves, and requested my aid in the following matter:—

Complaint of Theft.

Conjuring.

Theft discovered.

The son had sold a cow for 20 rupees and given the money to his mother, who said it was lost, and he wanted to know, whether his mother, sister, or wife, was the thief. I enquired if any one else had been in the house. He replied in the negative. I enquired of the mother, where she had laid the money? She replied underneath the clothes. I then proceeded to arrange my conjuring apparatus of the bowl of discolored water and steel spring; and writing the names of the five members of the family each on a separate slip of paper, confined each slip to a copper pice, by a layer of dough, and placed one of the pice on the spring. This in due course of time, by the process before described, was forcibly ejected from the bowl. Taking it up, and stripping off the dough, I proceeded to read the name. Then wisely shaking my head, I said, "Now I know the thief, who shall be exposed, if the money is not restored before morning." At midnight, I was gently awoke by the complainant's wife, who confessed to the abstraction of the money, and promised to do any thing, if I would not expose her; at the same time she counted into my hands the missing 20 rupees. In the morning, when the husband came to see me, I presented him with the rupees; saying, I had the greatest trouble in recovering them from the genii who had taken them away. Some of them were pressed on my acceptance, but I refused them, in order to sustain my character; but the good people would not be content, until they had cooked and packed up two fowls for my journey, on which I was accompanied for two stages by the grateful owner of the rupees.

Meetakhel.

From Karak I proceeded five kos to Meetakhel, over salt hills. The headman is Alladad Khan.

Zamankhel.

From Meetakhel I travelled six kos to Zamankhel, over salt hills of a red colour.

Kuharkhel.

Thence I proceeded four kos to Kuharkhel, over salt hills and through a jungle, and the next day six kos to Teeree.

Mameekhel.

From Teeree I proceeded five kos to Mameekhel, over a high Pass, impracticable for artillery.

Seemaree.

Thence I proceeded seven kos to Seemaree over a hilly tract; one division of this place, Seemaree-i-Paiyeen, is dependent on Hangoo. The headman is Mazulla Khan. From this place I had intended to visit Hangoo; but my funds being expended, and hearing from Meerza Samad, the son of Meerza Abdu Raheem, who had come to collect the revenue for his master Sultan Mahommed Khan, that a Persian acquaintance of mine, by name Agha Mehdee Khan of Ispahan was at Cohaut, I determined to proceed to that place, to procure his assistance. Meerza Samad entertained me with dancing and wine, the evening I staid with him.

Jabba.

From Seemaree I proceeded six kos to Jabba, which is dependent on Cohaut, over a high Pass, on the top of which is a tank. The whole of my stay in Lachee and Teeree, amounted to nine days.

Cohaut.

12th Zeehijjah.—Arrived at Cohaut, and proceeded to the house of my acquaintance, Agha Mehdee. Here the Persian writer became clamorous for pay. I silenced him, however, with some trouble, by promising to return from Peshawur with the necessary funds, for which place and purpose I accordingly made my arrangements for starting.

Digression to Peshawur.

On arriving at Peshawur, I took possession of the manuscripts I had sent from Tak by the hands of my cossid, whom I met here, and lost no time in making search for a fresh Meerza. I at last procured one, by name Safdar Shah, through the aid of Captain Burnes' Cafila Bashee, a resident of Peshawur; who after a great deal of hesitation, lent me some money, and took the security of Safdar Shah's father, that he would not desert me.

Mitanee.

Returning from Peshawur, I arrived at eight kos at Mitanee; passing Bara-i-Kalan, and the following Momand villages; viz. Bahadur, Mashookhel, and Ouzye, &c. over ground abounding in ravines and jungle.

Akhor.

From Mitanee I proceeded seven kos to Akhor, and put up with Malik Hakeem Akhorwal, by tribe an Afreedee, and a great robber. The road was stony and through defile. At the entrance of the defile are two ruined forts and a large tank. There is a large town here, erected by the Afreedees. One thousand rupees are yearly levied here on salt.

Return to Cohaut.

From Akhor I proceeded to Cohaut over a hilly road, and through a defile; the neighbourhood abounding with Afreedee villages, and put up with Agha Mehdee in the village of Myankhel, near the shrine of Hajee Bahadur. On the road passed the village of Zarghoonkhel, where there is a large tank and four towers, one at each angle of the village, and four kos further on, passed the village of Torakee, which is situated on an eminence; and then the Cohaut kotal or Pass, which is very difficult, especially of descent. On the top of the Pass is a tower, nominally for the protection of the road; but it is garrisoned by twelve men of the Afreedee tribe, who, although entertained and paid by the governor of Cohaut, are often themselves engaged in plundering merchants and travellers. At the bottom of the Pass is a second tower, garrisoned by twenty men. At Cohaut I discharged the former Meerza, having paid him up.

Pass.

Cohaut is divided into three tapppas, as follow: Bazeekhels, Samalzyes, and Meeranzyes.

Bazar.

Cohaut itself is included in the territory of the Bazeekhels. The fort of Cohaut, in which the governor resides, is of a square form having four bastions, and situated on an eminence There is a second fort, in which there is a dwelling house and reception room, over which is the *mehman khanna.* There is a tower in the fort at the entrance and a covered well; drinking water is procured from seven springs outside the fort; three of the springs gush out from near the Telee's mosque, and four from the vicinity of the Bazar, by which four mills are turned. There are fifty shops, four mosques, and two dharmsals.

Cohaut has to the east the Afreedee country, the Torakees and Soorakees, and Khushalgar, to the west Hangoo, to the north the Pass, and to the south Lachee and Dour.

Neighbouring dependencies.

The following are the neighbouring dependencies of Cohaut, entered into the daftars as Bangash-i-Paiyeen Jangal, under Shah Zaman and Aslam. The cultivation is carried on by running water. There are one hundred and fifty houses. The fighting men amount to one hundred and ten. They are friends with the Sepas, and enemies of the Khattaks.

Peerkhel.

Peerkhel, under Maliks Raz and Jafar. There are one hundred houses, and eighty fighting men, who are friends of the Sepas, and enemies of the Khattaks.

Garee Myankhelan.

Garee Myankhelan, under Malik Nasarulla, contains fifty houses. The cultivation is conducted with spring water. In this division, the shrine of Hajee Bahadur is situated, as well as a large mosque, and a well with a Persian wheel. The fighting men amount to one hundred.

Bezadee.

Bezadee, under Maliks Arsala and Siffat, contains one hundred houses, and eighteen shops, and turns out sixty fighting men.

Meer Ahmedkhel, under Malik Mahmood, contains fifty houses, and turns out thirty fighting men.

Shekhan.

Shekhan, under Malik Sheraz, Afreedee, Zarghoonkhel, situated at the base of a hill, contains eighty houses; and turns out fifty fighting men.

Kaghazee and Nasratkhel.

Kaghazee and Nasratkhel, under Malik Noor. A number of other villages have been deserted on account of the tyranny of Sher Alee, the former governor. The cultivation is carried on from the river. The above two khels contain fifty houses, and turn out eighty fighting men; and are the jaghire of Ismail Khan, son of Jahandad Khan Popalzye.

Mahommedzye.

Mahommedzye, the jaghire of Agha Mehdee is under Malik Bashar, and contains two hundred and fifty houses, and two water mills. The number of fighting men is 95.

Ahad-i-Saboor.

Shah Kotah.

I paid a visit to the famous koh or hill of Ahad-i-Saboor, so much talked of by the people of Cohaut. It is situated on the road to the Samalzyes, and beyond Mahommedzye and Nasratkhel. I had heard that there was an old inscription which no one could read, and went therefore prepared to copy it: also, that there were the ruins of an old square fort, with the remains of the stable, harem, and pillars of a throne. I went in company with a party from Cohaut to this hill, which is also known as Shah Kotal. The foot of the hill is covered with jungle. On the side of the hill is an opening or cave, and on the outside are two stalactite looking pillars, the whole place evidently natural. The inscription alluded to, was nothing in my opinion but natural crevices and marks in the rock. On the hill are just perceptible, the remains of a very old fort. There is also a spring of water, and a large "peepul" tree. Adjoining this hill, is the hill of Damchoor, which extends to the Pass of Cohaut.

Bar is under Shahbaz Khan, and contains sixty houses and several vineyards. The cultivation is carried on by running water.

Kamar Dand.

Kamar Dand is under Gul Sher Khan, and contains thirty houses. The cultivation depends partly on rain, and partly on running water.

Soorgal.

Soorgal and Jabba are under Buland and Musaib, Zarghoonkhel Afreedees. The cultivation is carried on by water from the Kuram river. The fighting men amount to 50.

Jarma and Shapoor.

Jarma and Shapoor are dependencies of Garee Myankhel, the former is nearly a waste; and the surrounding jungle is very dense.

Togh is under Mulla Ahmed and Kaim, and contains four hundred houses. The cultivation is carried on by a large canal from the Kuram river. The fighting men amount to 160.

Teeree Tang.

Teeree Tang is under Malik Nasro, and contains two hundred houses, and turns out 70 fighting men.

Khurmatoo.

Khurmatoo is under Kuram Sher, and is cultivated from the Kuram river. The fighting men amount to 80.

Thattee and Maramzyes.

Thattee and Maramzyes are under Malik Himmat, and contain one hundred and twenty houses. There is a great portion of waste land.

Kot-i-kandiyalee.

Kot-i-kandiyalee is under Maliks Akram and Aizam. It contains one hundred houses, and 50 fighting men.

Zanjeer Kamar.

Gandiyabee Killa, known as Zanjeer Kamar, is situated on an eminence, and is now in ruins. It is reported to have been built by the former Hindoo rajas. There are remains of bastions, a stable, and tank. Of the wonderful zanjeer, or chain, from which the place derived its name, there is of course no vestige.

Siah.

Siah is under Gul Mahommed. The cultivation is carried on from the Kuram river. The number of fighting men is 60.

Tareekhel.

Tareekhel was formerly a dependency of Cohaut, it is now independent. They are neighbours of the Afreedees. The fighting men amount to 200.

Gadakhal.

Gadakhel is under Shahzadah and Khanawadah. The cultivation depends partly on the rain, partly on canals. There are four hundred and fifty houses. The fighting men amount to 200.

Dhoodah.

Dhoodah is under Mahboob. The cultivation depends on the rains. There are four hundred houses, and 80 fighting men.

Shadeekhel, &c. &c.

Shadeekhel, Kamal, Mandahkhel, Kotree and Muchkee are under Malick Samad, &c. There are four hundred houses, and the revenue amounts to 6,000 rupees.

Bazee.

The tappa of Bazee is under Naib Gul Maz Khan, whose family formerly enjoyed the whole of Cohaut. He is by tribe a Shakookhel. The revenue, including the customs, trades, and weavers and tax on herds amounts to 41,000 rupees, and the fighting men of the whole tappa amount to 1200. The people of Bazee are all Musselmen of the Sunnee creed.

The tappa of Samalzye is inhabited by Sheah Musselmans, and is farmed by Sher Alee Khan, Izzatkhel, father-in-law of Sirdar Sultan Mahommed Khan. The dependencies of Samalzye are as follow:—

Aleezye.

Mouza Aleezye, under Ghulam Khan, is situated in a valley, having to the north, across the hills, the tribe of Sepa, outside the fort are two hundred houses. The shrine of Myan Fatteh Shah is situated in the suburb of Koh. The fighting men amount to 80.

Ustarzye.

Ustarzye-i-Paieen contains a mud fort. It has two gates, one to the east, the other to the west, and two hundred houses. The fighting men amount to 100 Ustarzye-i-Bala under Meerza, and contains a mud fort with two gates both to the north. There are one hundred and fifty houses, and the same number of fighting men.

Kachee.

Kachee Bala-o-Paieen, under Muazim Sher, is divided into four mouzas, each containing a mud fort, and two large towers, and from four hundred to five hundred houses, as well as vineyards and pomegranate gardens. The fighting men amount to 200.

Marye.

Marye Bala-o-Paieen, under Jafar Alee, is situated on an eminence, having two hundred houses below, and 150 fighting men. This place borders on the Teera Pass, at the bottom of which are seven water-mills. The revenue of the whole tappa amounts to 22,00, rupees nominally, the whole sum being seldom realized. The people of Samalzye are noted for bravery; the cultivation depends chiefly on the Kuram river.

Meeranzye. The tappa of Meeranzye is a dependency of Hangoo, as far as Tal-i-Bulandkhel. From Cohaut I proceeded to Ustarzye and thence to Marye, where I took up my quarters in a mosque, where a man presented himself, saying, he had two wives, a grown-up son, and a daughter-in-law; that he had committed some gold and rupees Theft. to the keeping of his senior wife, which had been lost, and requested me, as I was a fakeer, to ascertain who had taken it. I accompanied him home, where I found all the members of the family disputing and interchanging high words. I enquired of the master of the house which wife was youngest. He replied—the one I have just married, and the management of the house is entirely in the hands of the boy's mother. I asked him which he liked best. He replied one has got old, and the other is pretty and young, what more need I say.

I requested that they should all assemble. On their presenting Conjuring. themselves, I wrote all their names on separate slips of paper, and folded them up separately, filling all with ashes; but one, which I filled with detonating powder. I then gave a stone into the hands of the Malik, and ordered him to strike each paper, as I gave the signal during my incantations. On the explosion from one of the papers ensuing, I pretended to read the name of the thief, allowing the party the night to consider, before being exposed. Towards night-fall, having occasion to go out, I was followed by the senior wife, who taking hold of my skirt, confessed she was the thief; having Discovery. been driven to the act, in the hope of attaching suspicion to her rival, and thus, estranging her husband's affections from her. She promised to return the articles, provided I would not expose her, and would do something with her husband, so as to induce him to visit Stipulation. her once a week. I promised this, and the articles were brought to me at midnight in the mosque. In the morning I sent for the husband, and presenting him with the missing property, enjoined him to treat his first wife with greater consideration. He after some disputation, agreed to visit her once a month.

My digression from Cohaut to Peshawur, my return to that place, and my journey to Teera, occupied eighteen days.

1st Mohurrum.—Proceeded seven kos to Sultanzye in the district of Teera, passing the Barah river and the Koh-i-Boland pass, which is difficult even for footmen. The sides of the hill are covered with jungle, and the cultivation is carried on with the water of the Barah river. There are three forts here, two belong to Band Alee Khan, Sultanzye Orakzye. The inhabitants are partly Sunnee, and partly Sheah Musselmans. The other chief is Alam Khan, Orakzye. The forts have all four bastions fitted to bear artillery. The fort in which Alam Khan resides is separate, and has a *mehman khanna* above the gateway, a small gun, without shot or ammunition of any description, is also near the entrance. There are twenty-two Shaheens mounted on the bastions. The fighting men amount to six hundred who are independent. Alam Khan being in the employ of Sirdar Dost Mahommed Khan, generally spends his time in Basoul, Jelalabad, and Cabool. He has eighty horses of his own, and receives 24,000 rupees pay. He has a jaghire in Basoul. In the times of the former Sadozye kings, the Orakzyes received from 22,000 to 25,000 rupees a-year. They are friends with the people of Jamrood, Barakee, and Alam Guzeer, and enemies of the Abdul Azeezkhels and Maneekhels. To the east is the Bangash road, to the west Usmankhels and Istareekhels, to the north hills and the road to Peshawur, and to the south hills, and beyond them, the Hurbuz and Maneekhel.

Sultanzyes.

Alam khan.

2nd Mohurrum.—Proceeded seven kos to Abdul Azeezkhel. The cultivation chiefly depends on the rain. There are five hundred houses. The headman who is also a holy man, is Meer Maddat Shah, he is a *peer*, or spiritual chief of the Sheahs of this neighbourhood.

Abdul Azeezkhel.

Maddat Shah.

The inhabitants have separate forts, and muster 450 fighting men, a lawless set. They are friends of the Maneekhels, and enemies of Mastee and Shekhan.

This year, which was one of scarcity, wheat sold at four and half *akahs* the rupee, and juwar at five or six *akahs* [one *akahs*, seven Peshawur seers.]

The inhabitants carry their hatred of the rival sects of Sunnees to an inveterate extent, and during the ten first days of the Mohurrum, their penances are very severe. They fast the

Sheeahs.

days, and hold their meetings in the house of Maddat Shah, who has the most unbounded influence over his disciples, the Maneekhels and Abdul Azeezkhels.

In these districts, apples, grapes, mulberries, walnuts, pears, pomegranates; in short all the Cabool fruits are produced in plenty.

In the hot weather, the situation is peculiarly pleasant. To the east is Garee Rustam Khan, to the west Mastee and Shekhan, Mullakhel and Baramadkhel, to the north hills, and beyond them, the Afreedees and the road to Jelalabad, and to the south the Maneekhels. They have never paid revenue since the time of the Chaghatye kings.

Maddat Shah.

During my stay with Maddat Shah, I saw none of the assumptions that the Sunnees give him credit for; but his disciples, certainly, are in some instances, beyond bounds in the homage they pay him. In their prayers, for instance, they ask forgiveness in his name and those of his children and forefathers.

Awkward mistake.

During my stay, my Persian Meerza who was a Sayad, made a mistake, which was nearly proving of serious consequence. He one day seated himself on the vacant cot of one of Maddat Shah's sons. I overheard the bye-standers muttering a threat, that if he were not a guest, they would kill him for the insult. I explained, in extenuation, that my companion was a Sayad, as well as my host. "He may be," was the reply, "but for all that, he shan't presume to sit on that cot."

Veneration.

The Bangashees perform the pilgrimage to Meshed. I have often met them in Persia, and whenever the name of Maddat Shah is mentioned, if they are seated, they immediately rise, and press the forefinger of their right hand, half closed, first to their lips and then to their foreheads.

Maneekhel.

Maneekhel is pleasantly situated in a valley. In the summer, this place enjoys the best climate in all Teera. The cultivation is carried on by spring and river water. The winter here is very severe; but the poor people find plenty of firewood near at hand. There are one or two mills on every canal. There are six hundred houses of stone and mud; and the fighting men amount to 800. They are enemies of the Sunnees of Mastee and Shekhan. The Sheahs of the neighbourhood are said to be descended from a con-

Shamal and Karah.

verted Hindoo, named Shamal, and the Sunnees of one, named Karah. To the east are hills, to the west hills, and beyond them Bangash, to the north the Abdul Azeezkhels, and to the south hills, and beyond them Bangash.

Baramadkhel.

Baramadkhel is situated on an eminence, in a valley beyond Maneekhel. The inhabitants are Sheeahs. The cultivation depends on springs and water from the Teera river. There are one thousand houses of stone and mud, and 600 fighting men. They are friends with the other Sheeahs, and of course enemies of the rival Sunnee tribes. The chief men are Ghulam Khan and Meer Ahmed Khan, Orakzyes. To the east is Karnar, to the west Maneekhel, to the north hills, and to the south Samal.

Usmankhel and Ferozkhel.

Usmankhel and Ferozkhel are inhabited entirely by Sunnees. The cultivation depends on the Teera river. Every village has its separate mud fort. There are five hundred and forty seven houses. Usmankhel is to the north-east, and Ferozkhel to the north. There are no regular appointed Maliks. The man who entertains best is chief for the time. The fighting men amount to 4 or 500.

Dress.

In every village of Teera there is a Hindoo's shop, and the Hindoos of both sexes in this district wear the same clothes as the Musselmans; and therefore cannot be distinguished by a stranger at a glance. The fruits here are very fine in the summer. The inhabitants dress in loose trousers, confined at the bottom; and in long shirts, sewn double and treble, reaching to the knee, and sometimes to the ankle. Dark-blue lungees compose their head dress. The women wear rows of silver coins as buttons on their vests.

Gehrajgal.

Incident.

Beyond Ferozkhel is Kilah-i-Gehrajgal in the Afreedee country, situated in a valley, of which the land is of a peculiar red colour, and through which the Barah river runs as well as the road to Basoul and Cabool. I was directed by Major Leech to visit a place called Rajgurh. I never heard of any place nearer approaching the name than this. To the east of Ferozkhel are the Zakhakhel Afreedees, to the west the Masteekhels, Shekhans and Mulllakhels, to the north the road to Cabool, and to the south the Abdul Azeezkhel. The inhabitants are independent. On arriving near Usmankhel, I met a young woman proceeding to draw water; she enquired who I was, and received for answer from one of my men, that I was a fakeer of a saintly character. She invited me to her house, where she presented me with a chillum, some raisins, and jalghozas, paying me attentions that did not seem to excite the jealousy of her husband; and at nightfall, brought a cot for me to sleep on. The unblushing overtures made by this woman in the course of the evening, and many other incidents on my journey, led me to form a very poor opinion of the simplicity of the country people of Afghanistan. They seem far to surpass the towns-people in the looseness of their morals.

State of Morals.

Ustarzye.

Ustarzye borders on the Khyber and Basoul. The inhabitants have all separate forts, amounting to twenty. There were formerly three thousand houses. At present there are even more, some at the fort, and some at the top of the table land. The cultivation depends partly on the rain, and partly on spring water. There is no fixed Malik. He who entertains most is the best man, and possesses greatest influence. The fighting men amount to upwards of 3,000. They are very independent, and great robbers. They are of the tribe of Orakzye. They are friends of the Afreedees, and enemies of the Abdul Azeezkhels and Maneekhels. They are, as might be expected, Sunnee Musselmans. To the east are the hills and the road to Peshawur, to the north are the hills, and to the south are the Abdul Azeezkhels.

Another devil cast out.

Before my arrival at Ustarzye, my fame as a fakeer had preceded me. Immediately after my arrival a man waited on me, and represented that he had a very beautiful daughter, who regularly every Sunday and Wednesday went mad, and sometimes struck herself, and sometimes her relations; that she was engaged to be married, and her intended had become averse to the match ever since the commencement of these fits; intreating me to cure her. I became at a loss what to do, and what puzzled me more, was, that the day of my arrival was a Saturday and the next day the girl, as was her wont, had the mad fits; and I was taken to the house and found her stretched at full length, heaping abuse on all her relations. I soon discovered that she was shamming, and commenced operations accordingly. I drew a line on the ground around her, and wrapped some brimstone in a rag and gave it to my servant, while I covered my own head and commenced incantations; telling the servant to light the rag, and apply it to her nostrils; while I ordered the father to hold her firmly until I told him to release her, warning him, that if he did so without my telling him, the devil, of whom his daughter was possessed, would kill her. On the burning brimstone being applied, she begged to be released in a sensible tone of voice. This I would not allow, until she spoke in the person of the possessing devil, and promised he never would return. I explained that it was necessary to give a written charm to prevent the return of the devil, and explained to the mother, that I wished to see the girl in private. On her being brought, I questioned her before the mother about the devil; she replied, that as long as the fakeer (myself) remained, he (the devil) would not possess her; but immediately on his (my) departure, he (the devil) would destroy her. After this, the mother motioned her daughter to depart, who refused, saying she would stay and wait on me. When we were alone, the girl told me the truth; which was, that she had a lover, and played these tricks that the match with the young man to whom she was engaged, might be broken off. I promised to aid her, and told her to get her betrothed to visit me. In the morning the young man came and asked me to do all I could to cure his intended of her fits. I explained that if she got cured, the devil would attack him instead; and proved it by my old apparatus of the bowl of dirty water and the steel spring, which ejected his name as the fated one. He was much frightened, and entreated me to point out a remedy. This I did by assuring him, he could never marry the "possessed," and live; and that therefore, he had much better take the other sister, who was also marriageable. This, after sometime was, with my assistance, arranged. The successful lover, who had hitherto remained in the back ground, now visited me, bringing with him some cooked dishes. He afterwards accompanied me one stage as a guide, and I left Ustarzye with the satisfaction of having caused the happiness of two beings at no one's expense.

Disclosure.

The cultivation of the Masteekhels depends on spring water. Their habitations are partly below, and partly on a rising ground. They have all separate forts, amounting to about twenty. The headman is Jemadar Misree. They amount to three thousand fighting men, and are friends of the Shekhans and Mullakhels, and enemies of Abdul Azeezkhels: and they are always armed night and day accordingly. This tribe and that of Shekhan are noted throughout Teera for their hospitality. To

Masteekhels.

Hospitality.

whole ten the east are the Abdul Azeezkhels and Maneekhels, to the west the Aleekhels, Sherzyes and Mamoozyes, and to the south the hills.

Shekhan. Shekhan extends to Naryab. There is no headman. The fighting men amount to three thousand. To the east are Abdul Azeezkhels, and to the west the Mullakhels and Alee Sherzyes. The cultivation of the Ismailzyes depends on the Samal canal, which runs towards Cohaut. It is divided properly into Akhel Rabiakhel and Ismailzyes. The headman is Sirdar Sayad Shah. They are friends of the Aleekhels. The fighting men amount to 1,000. To the east are the Alee Sherzyes, to the west Shekhan, to the north the Afreedees, and to the south the Tortareens.

Ismailzyes.

Alee Sherzyes. The Alee Sherzyes have six mouzas, and seven forts. The cultivation chiefly depends on the rain. The headman is Mazulla Khan. The fighting men amount to 3,000. To the east are the Mamoozyes, to the west the Shekhans and Masteekhels, to the south Bangash, and to the north the Afreedees.

Mullakhels. The cultivation of the Mullakhels depends chiefly on the rain. There are six mouzas dependent. The habitations are in a valley. The chief man is Mulla Ahmed Orakzye. The fighting men amount to 700. To the east are the Aleekhels, to the west Abdul Azeezkhels, to the north the Shekhans, and to the south Bangash.

Mamoozyes. The cultivation of the Mamoozyes depends on the Barah river. There are thirty or forty forts under Mazulla Orakzye. The fighting men amount to 400. To the east is Chamkanee, to the west Masteekhels and Shekhans, and to the north the Afreedees.

Chamkanee. The Chamkanee Orakzyes inhabit the base of the Seefed-koh range. Their cultivation depends on the rain. The fighting men amount to 3,500. The headmen are Noor Alee and Arsalla. They have internal feuds. To the east is Teera, to the west are Kuram and Bangash and the Shrine of Lot, to the north Suefd-koh, and to the south the hills I remained in Teera eleven days.

Kuzeer. The district of Kuzeer is in a valley beyond the Maneekhel Pass, the descent into which is very difficult. There is a covered tank of rain water near the top. The Pass is covered with trees. The inhabitants are called Bar Mahommedkhels. There are two forts on the plain, and three on the hill. The cultivation depends partly on springs, and partly on the rain. The people live in caves. The headman is Meer Ahmed Khan. The number of fighting men amount to 400. To the east is Bangash, to the west the Maneekhel Pass, to the north the hills, and to the south hills, and beyond them the Bengash country. The inhabitants are partly Sunnees and partly Sheahs. The latter are disciples of Meer Ahmed Shah, who resides among the Abdulla Azeezkhels, and Myan Noor Shah, who resides at Maree, a dependency of Cohaut.

Caves

Spiritual Chief.

On arriving at Kuzeer I put up in the mosque, when an old man presented himself, and entreated me to pay a visit to his son, who was ill at home with dysentery. I assented, and found the young man much reduced, and a young interesting wife mourning over him. I administered some warm tea, with a little ginger to him, which seemed for a time, much to the delight of his friends, to revive him. His father accompanied me a stage as a guide.

Buroonee is situated at the foot of a hill; the inhabitants are partly Afreedees, partly Orakzyes. The Afreedees border on the Khyber. The cultivation depends on the rains. There is no headman. They are friends of the Ferozkhels. To the east are the Kukeekhels and Rabiakhel Afreedees, to the west the Afreedees, to the south the Ustareekhels, and Caree-i-Alam Khan Orakzyes. They are independent.

Buroonee

13th Mohurrum.—Proceeded to Hangoo, known as the tappa of Meeranzye. The cultivation depends partly on wells, partly on running water. There are one hundred and forty houses, fifteen Hindoo shops, seven dyers and blacksmiths, and twenty-eight lungee weavers. Azeezulla Khan is hereditary chief of the Meeranzye tappa, and the authority of his ancestors extended to Naryab Tal and Bulandkhel; but he is now a fugitive from the tyranny of Sultan Mahommed Khan.

Hungoo.

At present the chief men are Sadulla and Samad Bangashees. Hangoo is farmed by Naib Darbarza Bangashee, a resident of Togh, for 30,000 rupees. Out of this he draws his own pay, which amounts to 5,000 rupeees. He has 60 horse and 730 foot; and he sometimes has as many as 110 horse for the revenue collection. Hangoo is divided into the following mouzas: Raisan Ibrahimzye, Poodokhel, Bazar, Malkhoora, Ragho, Garee Saiyadha, Togh, Bandah-i-Shekhan, Bhookhel, Baukhounee, Bagdoo &c. &c. The inhabitants of Hangoo are nearly all Sheeahs. There are six springs in the tappa of Meerazye; three to the north, at the foot of a hill near the shrine of Meer Shah Tootee and Meer Shah Umar, and three to the south. In former times, the number of fighting men amounted to 3,000. At present they do not muster 1,000. They are friends of the Khattaks, and enemies of the men of Naryab, Dar Samand, Tal, and Bulandkhel. To the east is the road to Cohaut, to the west the road to Maryab, to the north hills, and beyond them Teera, and to the south the Khattaks.

Division.

The Khattaks, Bangashees, and men of Teera, all wear grass sandals, and the women go bare-footed. Hajrab yahood (lapis judaicus) and shadanij adasee (blood stone) are found here, near the shrine of Meer Shah Tootee. At this place I broke off another match, at the earnest entreaty of one of the parties, a pretty young girl, who declared she would destroy herself if I did not release her from it, and thus her blood would be on my head. In the excess of her gratitude, she tore her silver necklace off, and pressed it on my acceptance; I however would receive nothing but a few roasted fowls.

Dress.

Another marriage broken off.

15th Mohurrum.—Proceeded seven kos to Kahee, which was formerly dependent on Hangoo, passing two tanks on the road, and a jungle of "*mazr*" and wild flowers of a yellow colour. The cultivation depends entirely on the rain, and they drink nothing but rain water. There are six hundred houses, and 500 fighting men, under Azeezulla Khan. They are friends of the men of Naryab, &c. and at enmity with the Khattaks. To the east is the road to Hangoo, to the west Naryab, to the north Teera, and to the south the Khattaks. The revenue formerly amounted to 240 rupees.

Kahee.

Sometime after my arrival at the mosque a man presented himself, took hold of the skirts of my garment, and explained, that he was a "*shikaree*," (slang for a thief,) and that he had been unsuccessful for sometime past in getting "*shikar*" (game,) and now wanted my prayers for his better luck. I complied

Pray for a Thief.

with his request, covered my head, and muttered something. He immediately started to put my prayers to the test that very night. He was unsuccessful, and it came to my ears that he had declared I was a cheat, and would strip me on my next stage.

Rencounter.

I started the next morning, and after proceeding some distance, saw that my friend of the last evening had kept his promise, and confronted me with three fellow-thieves. I lost no time, on his coming in sight, in placing some detonating powder on a stone; on his commencing to abuse me as a cheat, I rested my walking stick, in rising, on the powder, saying at the same time, "Whatever is done, is done by the will of God." The usual explosion ensued, and the thief, in repentance, threw himself at my feet.

Maryab.

Mules.

Shrine.

16th Mohurrum.—Proceeded five kos to Naryab, (known as Badahkhel), the cultivation of which depends on a running stream that comes from the direction of Teera. There are seven hundred houses, and sixty shops. There is here an extensive sale of horses and mules. The Wuzeeree unbeaten iron is sold for twenty-eight seers the rupee. It is beaten here and sold at twelve and fourteen seers. There is a mud fort, having two gates. A canal runs through the bazar. Near the gates is the shrine of a descendant of Myan Tahir Shah. The headmen are Aner Khan and Nijabat, Badahkhel Bangashees. The fighting men amount to 500. They are friends of the Habiakhels, and enemies of the men of Zeemukht. To the east is Kahee, to the west Dar Samand, to the north Teera, and to the south the Khattaks. The revenue, if enforced, amounts to from 900 to 2,000 rupees.

Dar Samand.

Anecdote of Meerza.

17th Mohurrum.—Proceeded five kos by night to Dar Samand, having procured the company of two Hindoos, who were furnished with two guards, (Badrakas.) The Persian writer, who used always to lag behind; on this stage, as there was danger, to my astonishment I observed running ahead, with his shoes in his hands; and only overtook him at the next stage. On inquiring the reason of his unusual activity, his reply was: "Fear is the brother of Death." There are two or three mud forts in Dar Samand. There are two springs, one called Neelee to the north, and the other Gulab to the south, which springs from the Gulab hills. It is also called Regee. There are seven hundred houses. The headmen are Bakar and Turabaz. The number of fighting men amount to 700. They are friends of the Zeemukhts or Torttareens, and enemies of the Khattaks. To the east is Naryab, to the west Tal, to the north the hills, and to the south the Khattaks.

Indiscretion of Meerza.

At this place, the Persian Meerza was nearly getting into a scrape, from which I was only just in time to extricate him; having first recourse to admonishing him harshly. He had accepted the invitation of a mistress of one of the houses in the village to supper, after having written out for her a charm she requested, and I found him making himself quite at home in her house, and the intimacy gradually growing to an indiscreet extent.

Tal.

Kuram river.

19th Mohurrum.—Proceeded six kos to Tal, known also as Badahkhel, which contains a square mud fort, having one of the bastions full to bear artillery. The cultivation partly depends on the Kuram river, which takes its rise in the Sufedkoh mountains, and passes through Kuram, Tal, Cohaut, Bannoo, and Murwat; and partly on a spring to the north, called Sangroyah. There are seven hundred houses of Musselmans, thirty five Hindoos, and twelve shops. There is a great horse and mule market here. There is a very large cave in the Zeemukht hill, which has never been explored, which has a draught of air always issuing from it, which makes a noise like the turning of mill-stones. Near this, there is also an impression on the rock of the palm of a hand, of which there are so many known in Khorasan as "Panjah-i-Shah," and looked upon as the impression of the hand of Hazrat Aly. There are flint rocks near, on which are two shrines, one of Peer Shah, the other of Peer Umar Shah; also an antimony mine of inferior quality, which however is exported to Multan. There are two Hindoo merchants at Tal. Better flint is to be procured, of a black colour, at a kos further off; which however, is difficult of access on account of the Wuzeeree robbers. The headmen of Tal are Bhahawadeen and Duranee, Badahkhel Bangashees. The fighting men amount to 600. They are friends of the men of Naryab, Kahee, and Kuram, and enemies of the Khattaks and Zeemukhts. To the east is the road to Dar Samand, to the west the road to Kuram, to the north the hills, and to the south the Kuram river. The inhabitants are

Panjah-i-Shah.

Antimony.

almost independent. They formerly paid to Sultan Mahommed Khan 240 rupees a-year. When a force is sent (which seldom is) 2,000 rupees is collected at once.

Bulankhel.

20th Mohurrum.—Proceeded six kos, passing the Kuram river to Bulandkhel, which contains a mud fort, with two bastions and two gates. The inhabitants are Badahkhel Bangashees. The cultivation depends on the Kuram river. The houses amount to three hundred and twenty-five; and the Hindoo shops to sixty. There are seven dealers in mules, horses, and sheep. The amount of fighting men is 300. They are friends of the Wuzeerees and enemies of the Khattaks, and people of Tal and Khost. To the east is the road to Khost and Murwat, to the west the road to the Wazeerees and Kuram, and to the north the hills. They do not pay revenue unless it is enforced by troops. In the neighbouring hills, are villages of the Wazeerees.

Zeemukht.

22nd Mohurrum.—Proceeded nine kos to Zeemukht, which is the name of a tribe of Tortareens, that emigrated from Herat, and colonized here. The fighting men formerly amounted to 3,000; they have increased. The cultivation depends partly on the rain, and partly on springs. There are 20 or 30 forts in the valley, belonging to the Zeemukhts, who extend to the border of Teera. They are friends of the Toorees, and enemies of the men of Tal and Bulandkhel. Mules are plentifully produced in this country. To the east is the road to Naryab, to the west the road to Kuram, to the north Teera, and to the south the town of Bulyameen. The road abounds with jungle. At four kos I passed a stream of water.

Mules.

Bulyameen.

23rd Mohurrum.—Proceeded to Bulyameen, which is the boundary of Bangash-i-Bala and Bangash-i-Paieen. The latter extending from Cohaut to Tal. The villages of Makhzye and Bagzye are included in Bulyameen. There are in all nineteen forts. The cultivation depends on a stream from the Sufed-koh. There are one thousand and nine hundred houses, and a bazar containing twenty weavers of dark lungees and karbas. There are many mule dealers. The headman is a fakeer, who in the times of the kings, enjoyed a salary of 12,000 rupees a-year. The fighting men amount to 1,500. They are friends of the Toorees, and enemies of the men of Khost. To the east is Bulandkhel, to the west the road to Cabool, to the north Kuram, and to the south Khost and the Wuzeerees. The revenue is never collected but by detachments of troops.

Detail of the villages of Kuram, known as Bangash-i-Bala.

Sadah contains one hundred houses, under Adeen, Abdulla, Aly Sher, Sadah. and Nazar. The inhabitants are partly Sunnees and partly Sheeahs. The fighting men amount to 100. They are friends of the Toorees.

Balkh Shal contains a mud fort, and eighty houses, under Mahommed and Kuram Sher. The fighting men amount to 80.

Ibrahimzye, the jaghire of Sayad Ahmed, the son of Maddat Shah, Ibrahimzye. contains one hundred and twenty houses. The headman is Meer Hasan. The fighting men amount to 300. The jaghire was presented by Sirdar Dost Mahommed Khan, and consists of one-fifth of the produce.

Shaknee contains a fort on an eminence, and thirty houses under Dabood. The fighting men amount to 20.

Bat contains two mud forts and forty houses, under Chet, who can muster 35 fighting men.

Khela contains eighty houses, under Kasim, who can muster 55 men.

Alladad contains eighty houses, under Alladad and Allaiyar, who musters 55 followers.

Yakoobee contains a mud fort and sixty houses, under Noor Aly, who musters 44 followers.

Moora-i-Sayadha contains thirty houses, under Shah Abdul Hassan, who musters 25 followers.

Ameelkot contains eighty houses, under Meer Alee Khan, who musters 70 followers.

Kuter contains seventy houses, under Ghazee, a Tooree, who musters 65 followers.

Sultan contains two forts and three hundred and fifty houses, under Khusro and Ghulam, cousins, who are at enmity. The fighting men amount to 300.

Agrá contains two forts and eighty houses, under Meer Kasam, who musters 35 followers.

Shiblan contains one fort and one hundred houses on the banks of the Kuram river, under Karam Sher, who musters 84 followers.

Alam Sher.

Alam Sher contains two mud forts, and two hundred houses, under Jahangeer Khan, who is chief of all the Toorees, and Bangash-i-Bala. The number of fighting men amounts, to 150. To the west is Shilozan, to the east the road to Zeemukht, to the north hills and the valley of Kirman, which contains the shrine of Fakhr-i-Alam, the father of Maddat Shah, the spiritual chief of the Bangashees and Toorees, beyond which is the Sufed-koh range, and to the south Kuram.

Ahmedzye contains ninety-four houses, under Zamasp and Meerza Gul, who musters 80 followers.

Bilandeekhel contains one fort and two hundred and twenty houses, under Fatteh Khan, who musters 200 followers.

Aza Khel contains forty-five houses, under Neyamat Khan, who musters 35 followers.

Tahda contains one hundred and twenty houses, under Jahan Khan, who musters 100 followers.

Kamshal contains two forts and two hundred and fifty houses, under Shah Hasan, Gul Hasan, and Meer Hasan, who musters 260 followers.

Pishra contains forty houses, under Gul Mahommed, who musters 35 followers.

Meerza Khan contains one fort and one hundred houses, under Meer Mahommed, who musters 80 followers.

Fatteh Khan contains one hundred houses, under Alam Khan and Nasar Khan, who muster 90 followers.

Kot contain five forts and two hundred houses, under Fatteh Khan, who musters 180 followers.

Sheraka contains two forts, under Buzurg, who musters 100 followers.

Toolak contains one fort and fifty-five houses on an eminence over the river, under Khoja Baz, who musters 60 followers.

Kharlachee contains one fort and one hundred and five houses, under Shaheen, who musterss 120 followers.

Lalmee contains one hundred and forty houses round a fort, under Guldad, who musters 150 followers.

Aleezye contains three hundred houses, under Habeebulla Bangashee, who musters 280 followers.

Kirman. Kirman is situated partly in, and partly out of a valley, and consists of twelve or more forts, under Futulla and Meer, who muster from 900 to 1000 followers.

Zeeran. Zeeran contains seven or eight forts, each fort having thirty or forty houses around it, under Mahommed Meerza and Hyder Alee, who musters 607 followers.

Koh Badshahkhel contains two small forts. The number of fighting men amounts to 140.

Ghundee. Ghundee contains one fort, and three or four other small ones are dependent on it, and two hundred and fifty houses, under Ganjan Khan, who musters 200 followers.

Ahmedkhel contains one fort, and turns out 120 fighting men.

Shilozan. Shilozan is a beautiful district, containing twelve small forts and ten streams, that all have their rise in the Sufed-koh, and fertilize the whole of Kuram. Silk is produced here of a very fine quality, and all the inhabitants engage in the produce. The headman is Meerza Hasan, whose sister is the wife of Dost Mahommed Khan, and mother of Mahommed Afzal Khan. The fighting men amount to 800, who are all Bangashees.

Paiwar contains six or seven forts, each fort having one hundred houses, under Noorak and Moosa, who muster 140 followers. The men of this place act as guides and guards to the Bangashee and Tooree pilgrims, who, as Sheeahs, could never otherwise pass the country of their inveterate enemies, the Jajees, who are Sunnees. These men take them by unfrequented hill roads to Logur, and receive from each pilgrim in return, 2 or 3 rupees.

Notice of Bangash-i-Bala, known as Kuram.

From the entrance of the Chamkanee valley to Bulyameen, is geographically included in Bangash-i-Bala, and the Toorees have the territory.

The whole of Bangash-i-Bala is divided into twenty-nine miskalees, according to Meerza Hasan, partly as follow :—

The Darra-i-Chamkanee is situated in the Sufed-koh range. The fighting men amount to upwards of 3,000. The headmen are Baoo Khan and Arsalla. It is reckoned, ... 3 Miskalees.

Deda,	1½	ditto.
Kirman,	2	ditto.
Bulyameen, Maghzye, and Bagzye,	4	ditto.
Jajees, known as Zarakhel,	1½	ditto.
Ghundeekhel,	1½	ditto.
Aleezye,	1½	ditto.
Ibrahimzye,	½	ditto.
Ahmedzye,	½	ditto.
Balkh, Kamshal, and Nahda,	1	ditto.

Contingent.

The other details I did not succeed in procuring, The district is under Sirdar Dost Mahommed Khan. Its revenue amounts to about 52,000 rupees, of this the Dastar tax amount to 12,000 rupees. In former times, the Toorees, who have seized on Bangash, alone used to furnish 3000 foot and 500 horse, independent of Bangash-i-Bala; at present, including the latter, they might collect 5,000 foot and 800 horse. They are enemies of the Jajees. They have much property, and most of them trade.

The coarse rice of Kuram is famous, and the inhabitants chiefly live on it.

The inhabitants all dress in dark blue, and the only ornaments worn by the women are rows of small coins called Abbasee Kareem Khanee, sewn on their vests in rows. The trousers of the men are made tight below the knee. Their arms consist of selawas and long matchlocks.

The price of wheat, in plentiful seasons, varies from fifteen to twenty *thattees* (one *thattee* three Peshawur seers) the rupee, and in seasons of scarcity seven or eight *thattees*. The Hindoos of Tooree are only to be distinguished by their language, from the Mahommedans. The people of Bangash-i-Bala burn wood instead of oil.

Prediction.

On arriving at Paiwar, I put up as usual in the mosque, where a man presented himself, and requested me, as a fakeer, to tell him, whether the object he had in view would be accomplished or not. I drew some unmeaning lines on the ground, and told him to count them by fours, telling him that if one remained, his project would succeed; if two, it was doubtful; and if three, it would fail. He counted, and much to his delight, one remained. Promising if my prediction came true, he would make me a present of a mule, he took his leave. Some hours afterwards, I heard that his project had actually succeeded; which I learnt, to my astonishment, was no less a one than eloping with another man's wife. I never however saw him or the mule again.

Fulfilment.

The people of Paiwar are enemies of the Jajees, and friends of the people of Shilozan. To the west are the Jajees, to the east Shilozan, to the north Sufed-koh, and to the south Chamkanee. On starting from Paiwar for the Jajee country, as the Mangal robbers infested the road, and as there were Kuram and Sheeah merchants in the caffila, guards were procured to pass us over the Paiwar Pass to Kamshal. On approaching the Pass, twenty Mangal robbers joined the caffila; and Meerza Safdar Shah entered into conversation with them, and gave one a lungee, in which he had tied up some walnuts and raisins, to carry for him. On crossing the Pass, these gentlemen walked off, taking the Meerza's property with them, who forthwith vowed never again to make acquaintance on the high road.

Robbers.

29th Mohurrum.—Proceeded from Paiwar seven kos to Maskanee, which is in the Mangal territory; passing the Paiwar Pass, which abounds with *archah* trees.

Maskanee.

30th Mohurrum.—Proceeded seven kos from Maskanee to Sufed-koh, where I was stopt by wind and snow, at a fort in a valley, called Paryan, whence three valleys separate; one leading to Jajee, the second to Mangal, and the third to Logur. A short time after putting up in the mosque, a good looking young lad made his appearance, and gave me the usual salutation which I acknowledged, then approaching he took my hand, and with a sigh, said he wished to renounce the world and turn fakeer too. On enquiry, I found he had no relations but a widowed mother. I in vain tried to dissuade him, by pointing out the hardships and dangers of a fakeer's life. He insisted on remaining with me, and occupying himself in attending to my wants. When my companions had all fallen asleep, to my horror I found the young scoundrel was a hypocrite, and something much worse, from the disgusting nature of the overtures he took that opportunity of making. The Mangals amount to 3,000, who are all independent.

Notice of the Jajee country where I arrived on the 1st Safar.

Ahmedkhels.

The Ahmedkhels are located in a valley, and have five forts, two hundred houses, and 400 fighting men.

The Tarlakees are also located in a valley, and have three forts belonging, one to Malik Gul Khan, and the other two to his tribe. The forts contain eighty houses, and the number of fighting men amounts to 120.

Meerankhels.

The Meerankhels have six forts containing thirty houses each, one belonging to Alee Gul, another to Meerjanee, two to Sahib Khan, and two to Malik Madak. The number of fighting men amounts to 300.

Alishing is situated also in a valley, and contains twenty houses, and 40 fighting men.

Batela consists of two forts, containing forty houses, and 100 fighting men.

Loonees.

The Loonees have eight forts, containing two hundred houses, and 400 fighting men.

The Ameenkhels have two forts situated on the high road, containing sixty houses, and 130 fighting men.

Ahmadkhel consists of one fort, forty houses, and 100 fighting men.

The valley of Dreplara contains two forts, one hundred and twenty houses, and 400 fighting men.

Aleekhels.

The Aleekhels have five forts, one belonging to Khanee, one to Abdulla, two to Khanzadah, and one to their tribe. There are altogether two hundred houses, and the number of fighting men amounts to 600.

Mangals and Jadrans.

The Mangals and Jadrans are also situated in a valley, having to the east Khost and to the west Gurdez. They have in all 250 forts and 500 black tents. They are perfectly independent, and pay revenue to no one. A great quantity of the hilly lands are laid out in terraces and cultivated.

Hasankhels.

The Hasankhels have three large and four small forts, containing three hundred houses. The number of fighting men is 1,000. There are many gardens here.

Kochee consists of three forts, containing one hundred and fifty houses, and numerous gardens, and 400 fighting men.

The fort of Shah Mahommed contains fifty houses, and 200 fighting men.

The fort of Sarwaneekhel contains fifty houses, and 100 fighting men. The apricot gardens are numerous.

The fort of Malik Myandad, and another of the tribe, contains thirty houses, and 100 fighting men. There is continually rain at this place.

The fort of Saiyadee contains eighty houses, and 300 fighting men.

Description of the road from Jajee to Khushee, (where I arrived on the 2nd Safair.) in the district of Logur.

Beyond Jajee is the narrow valley of Hazardarakht, which is a complete jungle of *archah* and *sanobar* trees. Beyond this is the valley of Dreplara, which is six kos long.

Thence is the ascent of Shutar garden, where there is good pasturage. There is a mine here of a light-green-coloured stone, which is very heavy.

Beyond the Kotal or Pass, are Ghiljies and Ahmedzyes, who are dependent on Logur, as far as Khushee.

Khushee.

Khushee, where I arrived on the 2nd Safar, is a valley having four forts, containing two hundred houses, numerous gardens, and 50 *kulbas* of cultivated land. The number of fighting men is five hundred. There are two shrines; one known as Khoja Hasan, and the other as Khoja Khidr, where there is a Panjah. This place is a jaghire of Nawab Jabar Khan.

Punjah.

Zarghoon Shahr.

Zarghoon Shahr, which I reached on the 3rd Safar, is situated on a plain having small forts on the skirts of the hills. There is a shrine of Khoja Sadr-i-Auliya. The inhabitants are partly Afghans and partly Logurees, (Lahogardees). There are one hundred houses, three karezes, and three gardens. The fighting men amount to 420.

Gun road.

From Cohaut to Cabool, via Hangoo, Dar Samand, Tal, Naryab, Kuram, Paiwar, Jajee, and Khushee, there is a gun road.

Arrival at Cabool.

Completion of Tour.

On arriving at Cabool, which I did on the 4th Safar, I received from Captain Burnes 20 rupees for travelling expences; remained three days and setting out, joined my employer at Candahar, on the 15th Safar.

Proceedings of the Asiatic Society.

(Wednesday Evening, 5th July 1843.*)*

The regular monthly meeting was held on Wednesday evening the 5th July, and by invitation from the Honorable the President, the Society assembled at Government House, its own premises being under repair.

The Honorable the President was in the chair.

J. W. Fulton, Esq. Barrister at Law, was ballotted for and declared duly elected; the usual communication was ordered to be made to him.

The following Books presented and purchased were on the table:—

Books received for the Meeting of the Asiatic Society, on the 5th July, 1843.

The Calcutta Christian Observer, July 1843. New Series, vol. iv. No. 43. Presented by the Editor.

The Oriental Christian Spectator. Bombay, June 1843, vol. iv. No. 6. Second Series. Presented by the Editor.

Jameson's Edinburgh New Philosophical Journal. Edinburgh, 1842, vol. xxxii. No. 63. (Purchased to complete the vols)

Proceedings of the Geological Society of London, vol. iii. part ii. Nos. 89 and 90. Presented by the Society.

Journal des Savants, Octobre, 1842, Paris. Presented.

The Calcutta Literary Gleaner, July 1843, vol. ii. No 5. Presented by the Editor.

The Annals and Magazine of Natural History, February and May. London 1843, vol. ii. Nos. 68 and 71. Purchased.

Yarrell's History of British Birds. London 1842, parts 34, 35, 36.

Bellefond's Memoire sur le Lac Moeris, publié par la Societé Egyptienne. Alexandrie, 1843. Presented by C. B. Greenlaw, Esq. on the part of A. S. Walne, Esq. of the Egyptian Society of Cairo.

Niebuhr's History of Rome. London, 1842, vol iii. Purchased.

Antiquitates Americanæ. Edidit Societas Regia Antiquarium Septentrionalium. Studio et Opera C. C. Rafn. Hafniæ, 1837.

Chinese Drawing of the Porcelain Tower at Nankin, with description. Presented by J. McCann, Esq.

History of Hyder Naik, Nuwab of the Carnatic, published by the Oriental Translation Society, as translated from an Original MS. of Meer Hussun Ali Khan Krinnani, by Col. W. Miles. From the Society.

The Secretary reported as follows:—

That the books sanctioned to be sent to Mr. Konig, bookseller of Bonn, in exchange for the publications forwarded by him, were in course of shipment.

That the collected amount of the subscriptions for the Kit-Cat Portraits of the Honorable Sir Edward Ryan, and the Honorable H. T. Prinsep, Esq. stood as follows:—

Sir Edward Ryan's, ...	908 Rupees.
Hon'ble H. T. Prinsep's, ...	1,051 ditto.

It was resolved, that the following gentlemen be requested to form a London Committee for the fulfilments of the Subscribers' wishes :—

For Sir Edward Ryan's Portrait :—

The Honorable W. W. Bird.*
Honorable H. T. Prinsep.
W. Prinsep.

For Mr. Prinsep's Portrait :—

Honourable W. W. Bird.
Sir Edward Ryan.
W. Prinsep, Esq.

It was brought to the notice of the Society, that it would be highly desirable if a set of the Meteorological Registers from the Bombay Observatory could be procured and regularly supplied in future, and an application to Government for them was sanctioned.

It was also stated, that the Sub-Secretary, Mr. Piddington, had sent to France to Major Troyer, the following list of incomplete French works now in the Library, most of which had been presented by the authors, or by the French Government, and it was hoped Major Troyer would be able to obtain the completion of the sets as they might appear.

List of the defective Works received from France, for the Library of the Asiatic Society.

Agassiz, Histoire Naturelle des Poissons d'Eau douce de L'Europe Centrale. Planches, 1er livraison.
Cuvier Histoire Naturelle des Poissons, up to vol. xvi. 8vo.
Quatremere, Histoire des Mongoles de la Perse, traduite en Français, tome 1er, royal fol.
Livres des Rois, traduite en Français, par J. Mohl. tome 1er.
Histoire Generale des Huns, tome i. parties 1er and 2d, et tome ii.
Histoire des Sultans Mamloks de L'Egypte, par M. Quatremere, tome i. parties 1er et 2d.
Chronique D'Abou-Djafar Mohammed Tabari, par L. Dubeaux, tome 1er.
Jacquemont, Voyage dans L'Inde, 13 livraisons.
Ditto ditto Planches. Botanique 1er á 6, 8, á 34, 36, á 50. Poissons, 13, 15. Reptiles 9, 10, 12. Journal, 1 á 15, 17 á 19, 21.
Agassiz, Recherches sur les Poissons Fossils, livraisons 1, 2, 4, 8 á 13.
Ditto ditto Planches, 13 livraisons.
Vendidad Sadé, par E. Burnouf, Texte Zend, 11 livraisons.
L'Espagne Artistique et Monumentale, par P. de la Escosura, 1 livraison.
Harivansa, traduit par M. A. Langlois, 1er et 3er livraisons.

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* On his arrival in England.

Description de L'Egypte, ou Recueil des Observations et des Recherches, Antiquités, Description, tome 1er.
Ditto ditto.—Antiquites, Memoires, tome 1er.
Ditto ditto.—Planches a ditto, tomes 1er á 5em
Ditto ditto.—Etat Moderne, tomes 1er et 2d.
Ditto ditto.—Planches, id 1er et 2d.
Ditto ditto.—Histoire Naturelle.—Planches, tome 1er et 2d
Ditto ditto.—Preface Historique et Avertissement, 1 vol.

The Secretary moved, that he be authorised to forward to Major Troyer, two complete sets of the Society's Oriental publications, with a view to obtain in return from the French Government or others, to which he might judge it advisable to present them, works published at their expence; one for the Russian, one for the Dutch, and one for the American National Institute were also mentioned. This proposal was approved of, and the Secretary was authorised to carry it into effect.

Read the following extracts from a letter addressed to the Acting Secretary, Mr. Piddington, by Professor Wilson :—

East India House, 29*th April,* 1843.

MY DEAR SIR,—Your communication respecting the missing copies of the Mahabharata and Journal had been anticipated by an application from the Societé Asiatique, through Capt. Troyer. The books had been lying very quietly in the Library Store, as we knew not what to do with them. A letter from the Secretary to Government, to the Secretary to the Court, had been sent about the time the books were dispatched, but it did not specify for whom the books were intended, beyond the request that they should be sent to Allen and Co. The request was not attended to in the Secretary's department, nor was the letter communicated to the Library, and the books might have been here as long as the house stands, had not the application been made; a little more precision in future in forwarding any thing through the same channel will be expedient, and a private note to me intimating, that such and such books, &c. have been forwarded should always be added. Your memorandum specifies 56 copies of the 4th Vol. and 56 copies of the Index. There were no such things as the latter. There seems to be some mystery about this Index. I have applied to the Society already for copies for our Library, but no notice has been taken of the application, nor have any copies been sent to Allen. He seems to be ill supplied also with the fourth Volume, being obliged to borrow of us, and we have none to spare. It will be desirable to send home a few more copies, and to supply the 20 copies of the Index for this Library, the 56 for France, and an adequate number for Allen.* I take this opportunity of asking you, if the Society ever received any copies, and what number, of my Vishnu Purana, Sanscrit Grammar and Ariana Antiqua, and if they did receive them, I should be much obliged by being informed how they were disposed of. It is not from any curiosity regarding the Society's distribution that I wish for this information, but to guide my own. I have omitted sending copies to some of my friends in India, under an impression, that they might receive them from the Society, and I may have been mistaken. H. H. WILSON.

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* See Messrs. Allen's letter, which acknowledges receipt of these in the case per *Ellenborough.*

The following report from the Committee, appointed to conduct the publication of Sir A. Burnes' Drawings, was read and approved of—

Memorandum relative to the publication of Sir A. Burnes' Drawings.

The undersigned, who are the remaining members of the Committee appointed in 1841, for the publication of Sir Alexander Burnes' Drawings, beg to bring to the notice of the Honorable the President and the Committee of Papers of the Asiatic Society.

Original Committee.
Mr H. Torrens.
Dr. Spry.
Dr. Pearson.
Charles Huffnagle.
H. Piddington, Secretary to the Committee.

1. That the progress of the work is as follows:—

Drawings completed for publication, ...	31	0	0
Under examination, and with Messrs. Ballin' people or with the Artist, ...	29	0	0
Being a total of,	60	0	0

2. The Society's outlay to this day has been as follows:—

Paid to Artist, ...	850	0	0
For paper, (Messrs. Rushton and Bazar,)	1,012	0	0
To Printers and Colourmen, ...	2,632	0	0
Total, ...	4,194	0	0

3. Each Plate of 575 impressions, (of which 550 coloured and 25 plain,) costs as follows; viz.

Drawing on stone, ...	12	0	0
Printing and colouring, ...	87	0	0
Paper, ...	16	0	0
Co's. Rupees, ...	115	0	0
For 60 Sets is, ...	6,900	0	0

4. There remains to complete the publication about, ... 90 0 0

If all printed, these will cost at the preceding rates, ... 10,350 0 0

Total Cost 60 Sets ...	6,900
,, 90 ditto, ...	10,350
Total Co's Rupees,...	17,250

5. But though these plates will form a great ornament to a Volume of Transactions,* they cannot of course be published without letter-press, which it was proposed should be composed of a digest of Dr. Lord's notes, with such additions as may be farther required by the Zoological Curator to the Society, than whom there is no one more capable of performing the task creditably to himself and the Society. The work thus completed, would (like Buchanan's and Russell's Fishes, or Russell's Serpents,) be of standard reference to the naturalist on the Indus, from Scinde to Attock; a foundation for much more labour of detail by future observers; and the best proof which the Society can afford of its desire to encourage every branch of the Natural Sciences, and to second, with all its means, the measures of Government when directed to these important objects.

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* With Dr. Cantor's Chusan Zoology and Botany, they will make by far the most splendid work on Natural History, which has been published in India.

We beg to suggest, that the Honorable the President and the Committee of Papers direct official intimation to be given to Mr. Blyth, who is already aware of the design, that the plates are in a sufficient state of forwardness to warrant the commencement upon the letter-press, as the prompt preparation of the commentary with Dr. Lord's notes for the plates already finished will enable your Committee to recommend the publication of a 1st part of Burnes' Collection, forming a portion of the volume of the Society's Researches.

The Society will obtain, from the distribution of this splendid work, a means of repaying the offerings of other learned bodies, and of greatly extending its European reputation in the department of Natural History; such being the case, your Committee submit that urgent reasons are shewn for the speedy preparation of the requisite accompaniment to the plates.

Your Committee also beg to note, that two vacancies having occurred by the death and resignation of Members of the Society, it will be expedient to add to their present number. (Signed) H. Torrens.
C. Huffnagle.
H. Piddington.

It was stated, that a letter had been addressed to Mr. Blyth, as recommended by the Committee, of which the following is a copy :—

E. Blyth, Esq. *Curator Museum Asiatic Society.*

Dear Sir,—I am desired by the Hon'ble the President and the Committee of Papers to remind you, that there are now 30 of Sir A. Burnes' Drawings of the Zoology of the Indus finished and in our stores, and 30 more, in course of completion, being in the hands of the artists.

1. These 60 plates will cost in round numbers about 7,000 Rs., and there are stil 90 more, of which some may be left unpublished; but the whole will, under any circumstances, involve an expenditure of at least Co's. Rs. 15,000.

2. The Society, as you are aware, contemplates making these plates part of the forthcoming volume of their Transactions, and it doubts not, with your known ability, to produce one of which it may be proud, and which the Naturalist can place side by side with those of Russell, Buchanan, and Gould; but while anticipating this, it feels most anxious, that the Letter Press should be forthwith commenced upon; for it is aware that it cannot but be ill done if done in haste, and you yourself know how advantageous it is in India, to have full time for corrections and revisions.

3. I am therefore desired to express to you, the especial wish of the Hon'ble the President and the Society, that your part of the work should be taken in hand without delay, as they naturally feel, that in so costly an undertaking, nothing should, if possible, be left to chance or done in haste.

The Society at large would also be much gratified to have your progress in the work mentioned from time to time in your Monthly Report.

H. Torrens,
Secretary and Vice-President Asiatic Society.

A Portfolio of the finished and coloured Lithographs, with the original Drawings was upon the table, and greatly admired, as being far superior to any thing of the kind hitherto produced in India.

The Secretary stated, that in the month of January, the following letter had been received from Government :—

No. 1256.

To H. Piddington, Esq. *Officiating Secretary to the Asiatic Society.*
General Department.

Sir,—I am directed to transmit to you, Extract from a Letter from the Hon'ble the Court of Directors, No. 24 of 1842, dated 26th October, and copy of the letter from the Austrian Ambassador therein referred to, respecting the researches of the late Mr. Csoma DeKörös on the origin of the Hungarians, and to request, that copies of the papers therein alluded to, may be forwarded to this Department, for transmission to His Excellency.

I am, Sir,
Your obedient Servant,
H. V. Bayley,
Deputy Secretary to the Government of Bengal.

Fort William, *the 28th December*, 1842.

Extract from Letter, No. 24 of 1842, *from the Honorable the Court of Directors in the Public Department, dated the 26th October.*

We enclose as a number in the packet, the copy of a Letter from the Austrian Ambassador, respecting the Researches of the late Mr. Csoma DeKörös on the origin of the Hungarians, and we desire, that the papers requested may be forwarded to us for transmission to His Excellency.

To the Secretary of the Honorable United East India Company

Sir,—My Government, to whom I transmitted the information which the Honorable Court of Directors of the East India Company was so kind as to forward to this Embassy, concerning the death of Mr. Csoma DeKörös, has recently expressed the desire to obtain for the Library of the Transylvanian National Museum, those of the papers (left by the deceased Traveller to the Asiatic Society in Calcutta,) which *contain Researches on the origin of the Hungarians*, and which are therefore of a particular interest for the above-mentioned Museum.

I have therefore the honor to request you may express to the Honorable Court of Directors, how much obliged the Transylvanian Authorities should feel, if by their kind intercession the Asiatic Society at Calcutta, should allow a selection to be made of those papers which so particularly concern Hungary, or copies duly legalized to be taken from and forwarded afterwards to this Embassy. I have, &c.

London, October 6th, 1842. (Signed) Neumann.

(True Copies,) H. V. Bayley,
Deputy Secretary to the Government of Bengal

This was sent to the Ecclesiastical Registrar of the Supreme Court for his information and for a reply, but owing, first to the non-arrival of Mr. DeCsoma's effects from Darjeeling, and latterly to the absence of Mr. Turton from Calcutta, no answer had been obtained from him till now, when the following was transmitted :—

Estate of Mr. Alexander Csoma DeKörös' Deed.

To H. PIDDINGTON, Esq. *Officiating Secretary to the Bengal Asiatic Society.*

SIR,—With reference to the letter to your address from the Deputy Secretary to the Government of Bengal, No. 1256, dated 28th December 1842, together with an extract of one from the Honorable the Court of Directors No. 24 of 1842, dated 26th October preceding, and copy of the letter from the Austrian Ambassador thereto subjoined, respecting the estate of the late Mr. Alexander Csoma DeKörös, Librarian of the Bengal Asiatic Society, left by you at my office sometime ago, for the purpose of my furnishing you with the information therein referred to, I have to apologize for my not having earlier replied to it, having been left at my office when I was much engaged, and it subsequently escaped my recollection, from no letter from you accompanying it.*

I now beg to acquaint you, that I have since received a communication from the Government of India in the Foreign Department on the subject through their Attorney, and I beg to forward here with a copy of my reply thereto, which will put you in possession of all the information that I possess on the subject, and which I have furnished to the Government. I have the honor to be, Sir,

Your most obedient Servant,

THOS. E. M. TURTON,

Registrar and Administrator.

Calcutta, Supreme Court, Regr's. Office, 3rd *July,* 1843.

Estate of Mr. Alexander Csoma DeKorōs' Deed.

To T. B. SWINHOE, Esq.

Attorney to the East India Company.

SIR,—I have the honor to acknowledge the receipt to your letter of the 2nd instant, forwarding to me therewith, copies of one to your address from the Officiating Secretary to the Government of India in the Foreign Department, dated 24th ultimo, and of an extract from a despatch, from the Honorable the Court of Directors, dated 22nd March, No. 6 of 1843, regarding the estate of the late Mr. Alexander Csoma DeKörös, Librarian of the Asiatic Society of Bengal, and requesting me to furnish you with the documents therein referred to, in the manner required.

In reply, I beg to state for the information of the Government of India, that the event of the death of Mr. DeKörös having been reported to me as Ecclesiastical Registrar of Her Majesty's Supreme Court, I applied for and obtained letters of administration to his estate as in case of intestacy, and under and by virtue thereof, took charge of the Government Securities which remained in the hands of the Government Agent of this Presidency.

Mr. DeKörös having died at Darjeeling, the Superintendent of the station took charge of his effects, and did, under the direction of the Government, make over the same to me as administrator to the estate.

In June last year, Mr. Henry Torrens, as Secretary to the Asiatic Society of Bengal, addressed me a letter, handing to me therewith one in original to his address, from the late Mr. DeKörös, dated Calcutta, 9th February, 1842, and making an enquiry whether I, as administrator of Mr. DeKörös, with the full consent of the Society, would feel justified to act on the orders of the deceased, by making over the funds and effects that might come into my possession in my official capacity of administrator of the deceased, to the President and Secretary of the Asiatic Society, under their indemnity, against the claim of the next of kin of the deceased.

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* There is some misimpression here on one or the other side, but of no great moment . either a letter was sent, or the paper was left by me personally.—H. P.

Although I have not yet given any official reply to the above query, yet I have personally explained to Mr. Torrens, that I am not justified in supporting the claim of the Society under the directions contained in the deceased's letter, nor am I at liberty to treat it in any manner as a valid testamentary disposition of the deceased's property to the prejudice of his next of kin with reference to the late Act relating to Wills.

The Superintendent of Darjeeling has also lately made over to me on my application, the Thibetan Manuscripts collected by the deceased, which I intended to have made over to the Asiatic Society in deposit, on the guaranteeing to take due care of them, and to return them in case the next of kin of the deceased should not assent to their continuing there, and should require such re-delivery.

I beg to forward herewith, an exemplification of the letters of administration to the estate, authenticated copies of Mr. Torrens' correspondence with this office, and of the letter of Mr. DeKörös in favor of the Society, together with a copy of the Registrar's account current with the estate, made up to the 8th instant, exhibiting a balance on that day, in its favor of Sa. Rs. 3,000, and Co.'s Rs. 2,000 remaining invested in 5 per cent. Government Securities, and Co.'s Rs. 21 : 13 : 5, in cash, and 26 gold Dutch coins or ducats, and shall be obliged by your forwarding them to the Government for their transmission to the Honorable the Court of Directors, for the information of the next of kin of the deceased.

I have the honor to be, Sir,
Your most obedient Servant,
(Signed) Thomas E. M. Turton,
Registrar and Administrator.

Calcutta, Supreme Court, Regr's. Office, 26*th June,* 1843.

Read an application, transmitted by the Honorable Sir J. P. Grant from Ramjoy Turlonkar, Pundit of the Supreme Court, stating, that as the Society had obligingly presented to him the first three vols. of the Mahabarata, he trusted that it would kindly complete its gift by that of the fourth volume now published. Ordered,—That the fourth volume and a copy of the Index be sent to the Pundit through Sir J. P. Grant.

Read an application from A. A. Sevestre, Esq., requesting to be allowed to contribute to the subscription for the Portrait of Mr. H. T. Prinsep, which was granted.

Read the following letter from Messrs. Allen and Co.:—

To H. Piddington, Esq.
Acting Secretary to the Asiatic Society of Calcutta.
London, 29*th April,* 1843.

Sir,—We have the pleasure to acknowledge the receipt of Mr. Torrens' letter as Secretary to the Society, dated 16th February last, acknowledging several of our communications and our account up to the 30th June last. We propose to render the continuation of the account at the expiration of a year from the date of the last.

We beg to call the attention of the Society to the paragraph of the letter of the 16th February, referring to Arrowsmith's Map of India, and also to enclose a copy of the original order for it. By it you will see, we had not the liberty to act for the Society, and we therefore complied strictly with the order, and forwarded " Arrowsmith's latest Map of India of the largest size," which is more than double the size of our Map, and we concluded was well known to the members of the Society. We need not point out how much more advantageous it would have been to us to have supplied the Society with our own publication, but we should not have been justified in doing so, when " Arrowsmith's" was expressly ordered.

It will be evident to the Society, that we are not in fault in sending Arrowsmith's Map, and we trust on a reconsideration of the matter, the Society will remove the Map from Messrs. Thacker and Co., where we are informed it had been sent for sale on our account. Had we committed an error, we would willingly have borne the loss of the price of the Map, viz. £18 · 10.

The cases of books per the " *Ellenborough*" shall have our attention, they have just been received.

The books ordered in your letter of the 3rd February for the Society are not all of them procurable. No. 1 of Gray's Spicilegia Zoologica is only just published. Leach's Zoological Miscellany cannot be heard of, and we suppose it to be an American publication, it will be obtained if possible. " Andubon's Ornithology," &c. is not yet published. " Gray's Genera of Birds," will be sent with the part of his other publication, by the next ship, and will be delivered to you by Messrs. Thacker and Co.

We are, Sir,
Your most obedient Servants,
W. H. Allen & Co.

It was determined that under the circumstances, the Society would receive the map; and the Honorable the President intimated, that upon his arrival in England, he would forward to the Society, a first rate recent map. The special thanks of the Society were voted for this very liberal offer.

Read the following letter from Captain D. Williams, Assistant Commissioner, Arracan :—

Ramree, June 12, 1843.

My dear Sir,—I beg to return my best thanks for the Birman Code of Law; it appears to be a collection of cases for easy reference; the Dammathul is a voluminous code, and is not to be obtained, I believe, complete in this province. It is arranged under distinct heads, has every other mark of being a genuine Code of Laws, and the Mugs have a great partiality and reverence for it. Seldom would they transgress it even for their advantage: for instance, mortgaged lands are surrendered to emigrants in this district after 40 and 50 years' absence, so sacred do they consider their law on this head, and they could evade it by coming into our Courts, as we give a contrary decision, by which they would keep possession: they have no Limitation Laws in such cases.

I have sent to Chedooba for the coins, and when I have received them, I will have great pleasure in sending you for presentation to the Asiatic Society two coins. There are eight in a good state of preservation, and many pieces, four of the former I must send to Lieut. Phayre, the Assistant Commissioner at Sandoway, according to my promise.

Lieut. Phayre is a good Birman scholar, and his information regarding the "Dummasat" would be very valuable to you. He is now compiling a list of Kings of Arracan of the Mug dynasty, and of Governors of the Province under the Birmese rule, from a valuable collection of coins in his possession; its perusal will no doubt be enjoyed by your Society.

I forward to Lieut. Phayre, the copy of the Dummasat and your letter, requesting he will communicate to you his opinion. Your's truly,

D. WILLIAMS.

Read the following letters from the Secretaries to the Government of India and Bengal :—

No. 682.

From the Secretary to the Government of India, with the Governor General, to Secretary to the Asiatic Society at Calcutta.

Foreign Department.

SIR,—Under instructions from the Right Honorable the Governor General, I do myself the honor of placing at the disposal of the Asiatic Society, the accompanying Report from Captain Graham, on the Manners, Customs, &c. of the people of Shoa, and an Historical Account of the Abyssinian Church by the same gentleman.

2. As these documents are originals, I have to request that you will be good enough to make them over when done with, to the Officiating Secretary at the Presidency Office, for record. I have the honor to be, Sir,

Your most obedient Servant,

J. THOMASON,

Allahabad, 13th June, 1843. *Secretary to the Government of India, with the Governor General.*

No. 575.

From Under-Secretary to the Government of Bengal, to H. TORRENS, ESQ., *Secretary to the Asiatic Society.*

SIR,—I am directed to transmit the enclosed Report by Capt. G. B. Tremenheere, Executive Engineer, Tenasserim Provinces, of a Visit to the Packchan River and some Tin localities in the Southern portion of the Tenasserim Provinces, together with a Sketch which accompanied it.

2. The Military Board, in forwarding the above Report, have intimated, that the specimens of Tin therein referred to, will be forwarded by Captain Tremenheere, when received, to the Curator of the Museum of Economic Geology.

I am, Sir,

Your most obedient Servant,

Fort William, 5th June, 1843. A. TURNBULL,

Under-Secretary to the Government of Bengal.

Mr. Piddington presented a paper for the Journal, being a translation of (with remarks) M. Stanislas Julien's remarks on the study of the Chinese

Language. He also exhibited the charts to his Eighth Memoir on the Law of Storms, (the Madras and Arabian Sea Hurricane of October 1842,) now in the Press.

The Librarian presented the classified catalogue of the European Books in the Society's Library, which is now printed, and for distribution to Members.

Mr. Blyth presented remarks on the Zoology of the Tenasserim Provinces, which will be farther alluded to in his report.

Read the report of the Curator Museum Economic Geology for June.

Report of the Curator Museum of Economic Geology for the Month of June.

Geological and Mineralogical.—We have received here, through Messrs. Allan, Patton and Co. from Major Sleeman, as executor to the estate of the late Dr. Spry, three mahogany cases, containing a considerable number of Geological and Mineralogical specimens, with a few corals, &c. some of these are in a state of sad disorder from being separated from their labels or envelopes, and evidently tossed about in utter confusion. I shall however be able, I hope, to verify the localities of most of the Geological specimens. None of these are complete series or collections, (with the exception of a small set of specimens from the Fort boring,) but a number are rare; many will fill up blanks in our cabinets, or replace inferior specimens, and are thus most acceptable to us.

I have now finished collecting from the Hoogly opposite to Calcutta, and from Burrisal at the other extremity of the Delta, two bottles of water for each month in the year, to ascertain the quantity of silt brought down by the river. I propose, with the approbation of the Society, forwarding one set of these to the Geological Society, with a request, that part of the silt may be sent to Professor Ehrenberg for examination as to the infusoria which it may contain; a question of very high interest to us here, as well as to the scientific world at home.

I mentioned in my preceding Reports, that through Mr. Howe's kindness, we had been provided with a large assortment of the shales and mud thrown up by the Volcano of Ramree; these I have divided into eight handsome sets, as follows:—

Memorandum of specimens from the Mud Volcano of Kyook Phyoo, collected immediately after its remarkable eruption of midnight 6th and 7th February, 1843.

A.—A bottle of the mud taken in a boiling state from the crater.

B.—Half calcined mud, taken from the walls of the crater.

N. B.—In some of these specimens, fruits and seeds of the surrounding bushes are found half burnt, but not destroyed.

C.—Mud from the neighbourhood of the crater, ejected from it in the eruption.

D.—The same with grass, &c enveloped in it.

E.—Mud indurated to shale, with veins of porcellanous *(aluminous ?)* earth and calc spar ejected from the crater.

N. B.—Thin plates of this calc spar found amongst the mud; the largest in the Museum of the Society being about 6 inches by 4, and evidently detached from the shale

F.—Indurated and laminated shale, sometimes approaching to sandstone, ejected from the crater, sp. gr. 2.5.

G.—Red shale indurated to a sandstone, (probably from the heat under pressure,) ejected from the crater, sp. gr. 2.6.

A single specimen in the cabinet of the Asiatic Society is red at one end, grey at the other, evidently shewing that they are derived from each other.

H.—Burnt sticks picked up shortly after the eruption about the crater.

Besides keeping our own cabinet well supplied, I proposed, with the approbation of the Society, forwarding these as occasion may offer as follows.—

1. Hon'ble the Court of Directors.
2. Geological Society.
3. Societé Geologique de Paris.
4. Royal Cornish Association.
5. Sir H. T. De la Beche.
6. University of Christiana.
7. Geological Society of Pennsylvania.
8. Academy of Natural Sciences of Philadelphia.

Museum of Economic Geology.—We have received from Lieut. Phayre, Sandoway, a set of clays from that place, six in number, and specimen of the best Tobacco soil, as also a porcelain clay from Bassein. His letter is as follows:—

Sandoway, May 5, 1843.

My dear Sir,—I have the pleasure to send you a box, containing specimens of the clays and earths of this district. All the brick clays are from the immediate vicinity of this town. I send also a specimen of Tobacco soil from the best Tobacco district here. I am aware that you have formerly analysed Sandoway Tobacco soils, but do not know whether those were procured, as this is, from the most famous Tobacco land or not. There is no pottery of any kind made here, I am sorry to say.

The white clay is said to be that from which the well-known *Pegu* pottery is made; it was brought from Bassein. Will you have the goodness to apply on board the H. C. S. *Amherst* for the box to your address. A. P. Phayre.

We have also received from Lieut. H. C. Mayne, Adjutant 4th Nizam's Horse, specimens of the salt of the Loonar Lake, with the following letter:—

Mominabad, May 26, 1843.

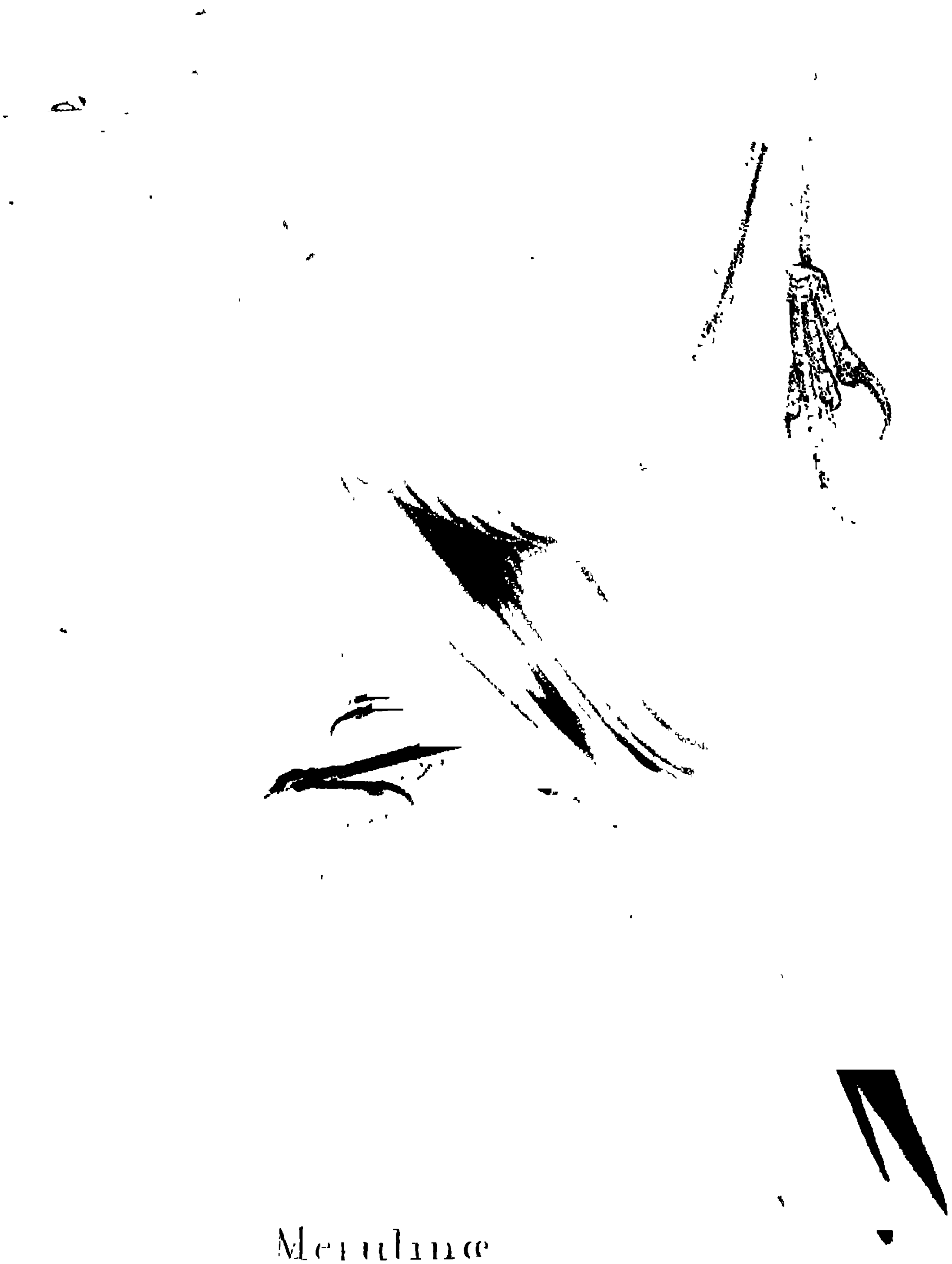
My dear Sir,—In reply to your letter of March 22nd, I beg leave to forward for the Museum Economic Geology of India, a specimen of the salt of the Loonar Lake.

You will perceive that the specimen is composed of three distinct species of salt. Large incrustations of this are left all round the edges of the lake, caused by the quick evaporation of the water by the sun, and partly from the foam of the wavelets as they beat on the shore.

The situation of the Lake of Loonar, is about midway in a direct line from Jaulnah to Hingolee, longitude about 76° 45′, latitude about 20° 1′. Hoping that this may prove an addition (however small) to the Museum, I shall use my endeavours to procure for its use, any interesting and curious specimen that may come within my reach, but not being a scientific character, I may be excused if I ever forward specimens, &c. which the Museum may already possess, or of so common a description, as not to be worth having. H. C. Mayne,

Lieutenant, Adjutant 4th Nizam's Horse.

P.S.—I have dispatched the piece of salt by this day's banghy to your address."

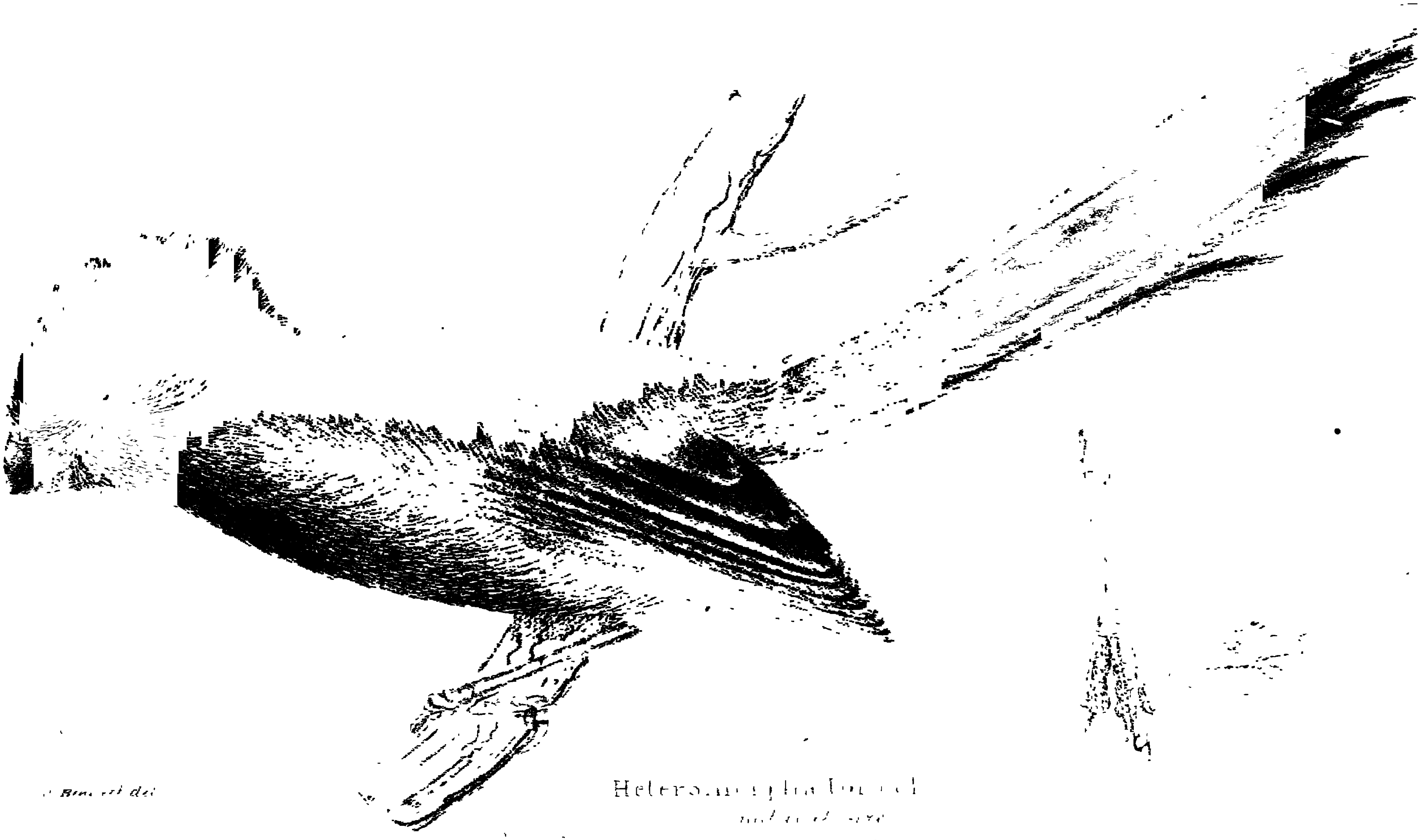


Merulinae

Grandala schistacea, type

Two thirds natural size

Stark-Chromolith. Trc.



[illegible] et del.

Heterocephalus [illegible]

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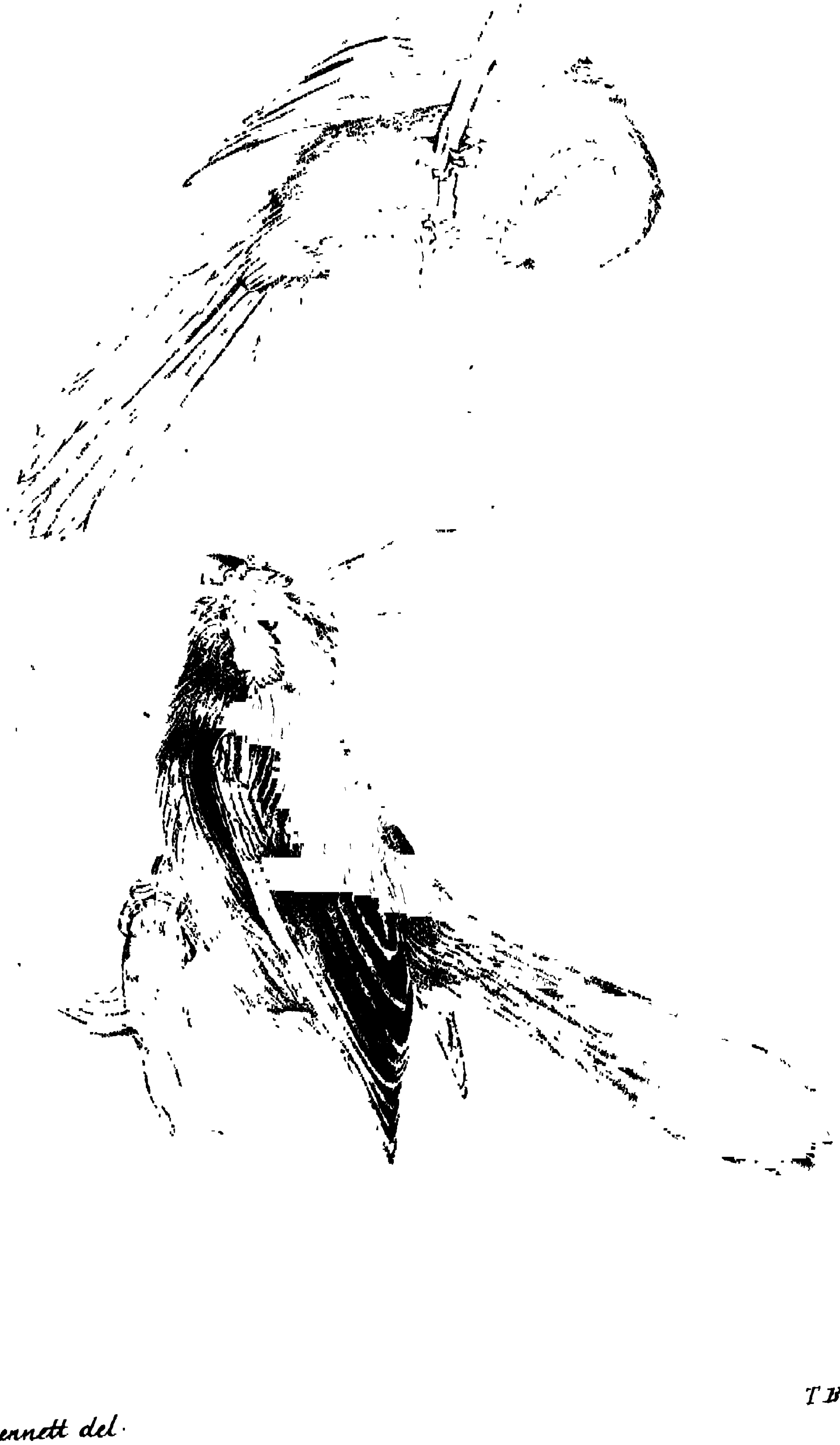

J Bennett del.

T Black lith

Temnoris Nepalensis type
Size of nature.

JOURNAL

OF THE

ASIATIC SOCIETY.

Report on the Manners, Customs and Superstitions of the people of Shoa, and on the History of the Abyssinian Church. By Captain GRAHAM, *B. A. from the Secretariat of the Government of India.*

From Captain W. C. HARRIS, *Engineers, late on a Mission to the Court of Shoa, to* J. P. WILLOUGHBY, ESQ., *Secretary to Government of Bombay, dated 8th May*, 1843.

SIR,—I have the honor to forward the accompanying able reports by Captain Graham, on the Manners, Customs and Superstitions of the people of Shoa, and on the History of the Abyssinian Church.

2d. These reports complete the information which was required by the instructions that I had the honor to receive from you.

I have the honor to be, &c.
(Signed) W. C. HARRIS,
Capt. Engrs. late on a Mission to the Court of Shoa.

Bombay, 8th May, 1843.

Report on the Manners, Customs and Superstitions of Shoa.

The last known tale of a plausible adventurer in this country has been wrought up with the most meretricious tinsel to serve a specious design on this country of the Christian savage, but all works, both ancient and modern, have succeeded in casting a film over the eyes of the deluded public, which honesty loudly calls out to withdraw. The king of of Shoa indeed forms an exception to most of the sweeping vices which disgrace the land, and his master of the horse has imitated his laudable example; both have been blessed with natural endowments, which in a more favored country, would have thriven to maturity, but sad though the truth may be, after months' wearisome endurance and patient research, there is to be found no third individual to add to the limited number of the praiseworthy.

2d. The nation is priest-ridden and bigotted to a degree. The most ridiculous doctrines must be believed, and the most severe fasts and penances must be endured, according to the pleasure and fiat of the church. Twelve thousand clerical drones, "*Fruges consumere nati,*" fatten in idleness on the labour of the working classes, and even the sites of their habitations tend to rivet the chain of bondage, which encircles the neck of the infatuated Abyssinian. On the very summits of the ranges, stand the churches and the monasteries high over the vales, and perched among the few remaining groves, dotting the cool shady peaks, and far elevated in their pride of place, above the residence of the common herd. The priestly intimation is received with more attention, issuing from a temple, shrouded from human ken in the thick heavy fog, and the thunder of excommunication is listened to with utter abasement and prostration of spirit, proceeding from the grand scene of elementary strife, and falling upon the ear of the awe-stricken serf, amidst the prolonged echoes of the confirming thunder of heaven.

3rd. The king however, has lately taken upon himself to proclaim by the voice of the herald, and the beat of the drum, those doctrines which *he* conceives to be most conducive to salvation, and by the summary deposition of the refractory spiritual chiefs, and confiscation of their property, he bids fair in time to promulgate a most curious religious code of his own, if not upset by a civil war, which may blaze out in consequence of his innovations.

4th. The land swarms with monks and anchorites, who are clothed in yellow dresses, or in the prepared skins of the antelope, and who, from the licentiousness of their manners, roam through the country a perfect pest and plague to society. Men become monks at any period of life. The rich deliver over their property to their children, who are bound to support them until their death. The poor live upon the bounty of the community, and many never enter the huts of the monastery, but with their wives reside at ease in their own homes, having joined the order for the mere sake of defrauding their creditors; for however deeply involved, the donning of the head dress, and the monastic habit clears off all former scores, with the ease and rapidity of the most indulgent court of insolvency.

5th. The skin of the (algeazine ?) is adopted as a dress by all who cover under the garb of humiliation a deep-rooted pride of their institution, and together with the unwashed person is meant to commemorate the legend of their great founder, Istathios, who boasted of no ablution during a long term of existence, and who miraculously crossed the river Jordan, floating secure upon his greasy skin. The prophet Samuel is also sometimes referred to, as affording another example of the advantages of the covering of hide, and the story relates, how he sailed in company with his disciples for seven days' journey on the surface of a great sea, borne in safety upon the leathern robes which formed the only mortal attire in those ancient days.

6th. Although monasteries are rife over the face of the country, yet the mountain Azzulo, situated near the river Hawash, is celebrated as the most sacred seat of monkery. The mountain continually emits dark smoke, and its only inhabitants are Christian fathers, who despising the world and its vanities retire thither, unmolested by Galla or Mahommedan, to spend their days in blissful peace and retirement, universally looked upon and feared as sorcerers; they are said to live on the most social terms with the lions and wild goats which abound upon the hill. The reception of youth as novices is by no means sanctioned by the monopolizing elders, to whom the tale assigns an exclusive subsistence upon the fruits and herbs and roots, which together with a pair of wings, are freely furnished them from heaven; but none of those who have as yet returned from the pilgrimage are stated to have brought back their feathered appendages, and the lank figure and dim eye betoken rather the toil of the weary wayfarer than the high enjoyment of Elysian feasts.

7th. The small encircling cord of silk round the neck, called the "Matab," is the emblem of the debased Christianity which exists throughout the land, the color is deep blue in reference to the smiling sky of heaven, and the turban of the priest and the monk is designed to commemorate the event of Moses covering his face on the mountain of fire, when receiving the tablets of the law.

8th. Uncharitable and uncompromising, the dread anger of the Church often blazes forth into the furious blast of excommunication, and the souls of men are consigned to perdition for the most trifling offence.

9th. The bell, book and candle, can be hired by any disappointed enemy, and the hooded priest can be purchased to perform the ceremony, but the question in some cases is not without difficulty and danger to the officiating clergy, especially when sacred majesty is concerned, or where the sturdy sons of Europe come under the ban of the Shoan Church. The cells of the state prison often enclose the fanatic priest, whose want only interferes with the royal salvation; indifferent fare and close confinement ensure an absolution, and the martyr to religious intolerance is expelled from the country.

10th. The *argumentum baculinum* is the only other antidote, and possesses a wonderful effect in stilling the storm, when persuasively applied to the shoulders of arrogant Church pride.

11th. On the latest occasion of the ceremony being performed upon the fair sons of the North, the priest was quietly laid hold of, and introduced into the interior of the domicile, where his countenance considerably drooped at the sight of an unwelcome host just arrived with a most formidable cudgel. "My father must have been mistaken," was the opening address which saluted his astounded ear, whilst the cudgel descended upon his shoulders with an equally startling salutation. "My father never could have purposed the excommunication of his dear friend," followed the exordium, and the cudgel again pattered upon the priestly back; a most able running commentary was sustained for nearly five minutes, attended by many playful taps upon the head to quicken the clerical understanding, and on the termination of the conclusive argument, the priest willingly withdrew his ban, bestowed his entire absolution and sneaked away to his cell, mentally resolving never again to interfere with those most incomprehensible Europeans, who displayed so little terror at being cursed by the Church, and who entertained no respect whatever for the sacred persons of her ministers.

12th. The Negus, however, is the true God of their adoration, and the essence of this devotion pervades the band to its very core. The best portions of the country pertain to His Majesty; the lives and property of the subjects are entirely at his disposal; every act is performed with some view to forward his pleasure; and all wait on his sovereign for favor, preferment and place. Mild, however, and just in his disposition, he is universally beloved in his own dominions in which the oath is by the life of the king in the land, wise and warlike in his expeditions, he is feared and respected among all the adjacent tribes; conducting himself with that easy freedom which generally distinguishes conscious superiority, his demeanour is kingly and commanding, and his character for impartial justice has obtained for him far and wide, the enviable cognomen of "the fine balance of gold."

13th. Here the precious metals form the exclusive privilege of royalty. Personal ornaments and colored raiment are prohibited to the subject by the severest sumptuary laws, and few, except the highest chiefs and warriors of the land, are ever honored by an exemption from the rule. All the appointments in the country are at the king's disposal. All rewards and favors come from the royal hand in years of famine. Food itself is only to be obtained from the royal store houses, and it is therefore by no means surprising, that the population should be mean, cringing and servile; that they should in their aspirations after honor and place, submit every action of their life to the despot's will, and in their present benighted social condition, even bring their wives and daughters to pander to the despot's pleasures.

14th. But Sabela Selassee is an unique specimen of absolute power, and the iron sceptre falls light from his merciful hand even on the head of the offender. His virtues are many and conspicuous; his faults entail harm chiefly upon himself; and the expenditure of the greatest part of his hours might be held up as a worthy pattern for imitation for all.

15th. After religiously performing his devotions early in the morning, he inspects his stables and workshops, bestows charity on the assembled poor, despatches couriers, and gives private audiences of import, and afterwards reclining upon his throne in state, he listens for hours to all the appeals from his subjects.

Here access is easy. The king listens to all foreigners and subjects, men or women, rich or poor; every one has a right to appear before him, and boldly to explain the nature of his case, and although established custom obliges the subject to prostrate himself, and pays rather adoration than respect, yet every complainant may tell his story without the least hesitation or timidity. Judgment is always prompt, and generally correct. At three o'clock His Majesty proceeds to dine alone, and after the royal appetite is appeased, the doors are thrown open, and the long table in the great eating hall is crowded with the most distinguished warriors and guests; harpers and fiddlers perform during the entertainment, and singers lift up their voices in praise of his magnificence and liberality; but the king during all this scene of confusion and turmoil, still continues to peruse letters and issue instructions until the table has been three times replenished, and until all of a certain rank have freely partaken of his hospitality. At 5 o'clock, he retires with a few of his choice friends to the private apartments. Prayers and potent liquors pass away the evening hours, and the company depart, leaving only the favorite page to convey to the inmates of the Harem, the royal commands.

Midnight calls his Majesty from his couch to the perusal of psalms and holy writings; a band of sturdy priests in his immediate vicinity during the live-long night continually chaunt a noisy chorus of hymns, to preserve their master from the influence of evil spirits and bad dreams, and daylight brings a repetition of the busy exercise on horseback, when business or the fickle sky will permit.

17. The nation displays a strange medley of good and evil, mildness and cruelty. Superstition, religion and fanaticism in venerating the sovereign, and dealing out largess to the poor. They are drunkards and liars of the first magnitude, and their minds being insensible to the charms of exalted virtue, they are restrained from evil deeds by no moral influence whatever. Kind to their animals, slaves and females, they practice every species of barbarity upon their enemies, and are perfect fanatics in their religious creeds which are of the most subtle nature. They are fiercely arrayed against each other in hostile sects, and are only prevented from carrying on war to the knife, by the local difficulties which separate the parties. Easily irritated, their anger blazes up into a fierce flame of passion, but like the crackling thorns, it is soon expended; dull in comprehending a joke, they delight in the broad antics of the court buffoon; and violent and litigious in their private dealings, they are still not disposed to carry their wrath to extremity, or to allow amongst

each other the brutal feelings to exercise an entire predominance, restrained by the wholesome law of blood for blood, and life for life.

18. The principal men of the country who are not entrusted with government, spend their time in utter idleness, lounging about the purlieus of the court, or gambling for hours at the game of *gibbeta,* leaving the management of their houses to their women, and the direction of their farms to their servants and slaves. All, however, end their day at 4 o'clock, when the king's table is thrown open to men of rank, and when the king's potent hydromel very soon incapacitates them for any further thought or deed. The most slovenly appearance marks the interior of their houses, and dirt and filth choke up the surrounding enclosure. The furniture is confined to a rickety bedstead, a bullock hide, and a small wicker table; the necessary wood fire in the centre of the solitary apartment blackens every article within the walls with a thick crust of smoke, presenting a most gloomy vista on entering the doorway, and the universal objection to the use of water, either as regards their person or clothes, renders the foul tableau still more disgusting.

19. Water as well as coffee and tobacco are studiously avoided, as savouring too strongly of Islamism, and the Christian inhabitant contents himself with rubbing his eyes in the morning with the dry corner of his dirty robe, and pouring a stream of rancid butter over his matted locks.

The dress of the men, from the king to the peasant, consists in a large loose robe of thick cotton cloth, enveloping the body in graceful folds; but nearly incapacitating the wearer from any great exertion on foot; frequently disconcerted and falling upon the ground, the wearer is every moment obliged to tuck up this most troublesome garment, and fold it anew about his body; a cotton waist cloth of many yards encircles the loins, and a pair of very wide trowsers hanging barely to the knee, sum up the ordinary toilet; although during journeys and expeditions, the skin of some wild animal fashioned somewhat into the form of a cloak is worn over the shoulder.

20. All carry a short crooked sword bound tight on the right side, which requires constant oiling, and some portion of personal strength to extract from the sheath; and entertaining a wonderful affection for the stick, no man ever stirs from the house, either mounted or on foot, without the long thin wand. Too lengthy to be of any use in urging on his animal, and too thin to support any weight as a staff, the inconveni-

ence is endured to keep the hand in constant practice for carrying the beloved spear. The clergy are more sensible in their predilections, and their stout staff with an iron crutch as a handle, is a very laudable instrument indeed, either for support or offence.

21. The men scrupulously denude their cheeks and chins, in the absence of the razor clipping with a pair of very indifferent scissors all the hair close to the skin, and thus adding very considerably to the dirty appearance of their unwashed faces; but the greatest attention is paid to the management of the hair, with which nature has most liberally supplied the head, and many hours are daily expended in dressing the mop into many and quaint fashions. It is sometimes worn hanging in long clustering ringlets over the cheeks and the neck; at other times frizzed into rounded matted protuberances, which are studded over the greasy block, often fancifully tucked and trimmed into small rows of minute curls like a judge's wig, and again boldly parted into four large compartments like jelly moulds, but always reeking with rancid butter, and exuding a most disagreeable effluvia.

22. The clergy wear a high white cotton head-dress and black woollen cloak, with coloured emblems of the faith attached in every direction for public view. Treated with highest respect and veneration, they are always addressed as Father, caressed and fed wherever they choose to turn their footsteps; all the natives fully believing that the kissing the hand of one of these dirty shepherds, purifies the body from every sin.

23. The colour of the Abyssinian race varies from a bright copper to the deep jet black; the men are by no means particularly handsome, but the features of the women are of an inferior and more disagreeable contour than those of most nations in the world. Small eyes and flat noses are added to high cheek bones, low foreheads and a broad expanse of countenance, and their attempts are exceedingly ingenious to render more hideous the uncomely appearance which nature has thought proper to bestow upon them.

24. The eye-brows are totally depilated, and a deep narrow line painted in their room with a strong permanent blue dye, bestowing a more than ordinary look of foolishness, whilst the cheeks of the high-born dames are plastered to the very eyes with red paint and fat; the hair is also either cropped, frizzed and besmeared with tallow

into a most frightful consistency, resembling in appearance and size an ordinary English bee-hive, or the bare shaven head is encircled by a narrow dirty fillet; and their feet, naked and exposed to all seasons and weather, become hard, horny and mis-shapen.

25. Their only dress consists of a large wide sack chemise, bound round the waist by a thin rag, and a long sheet thrown over the head descending to the heels, which like Ruth's veil is very coarse and strong, and fully capable of containing six measures of wheat. Their ornaments are large black wooden studs in the ear, which on holidays are replaced by masses of pewter resembling the teething rattles employed in nurseries; pewter bracelets and anklets, together with a profusion of blue and gold colored beads are worn by all who can afford the outlay, and the dirty toilet is not complete without a stream of rancid butter upon the hair, and the nostrils securely plugged up with lime peel or sweet herbs, leaving the end of this strange nosegay dangling over the wide mouth. They soon ripen and grow old, girls becoming mothers at the early age of twelve; but like the fruit of the medlar, they are rotten before the summer of life has well commenced.

26. All classes are most pertinacious beggars, every thing seen is demanded; knives, scissors, beads, cloth, looking glasses and dollars; the love of acquiring property stifles every sense of shame, and they feel no compunction in asking for the cloak off your back, or of carrying it away, even during a heavy storm of rain; they even take a pride in this national feeling, and say, that an Abyssinian child will stretch out its hand to receive a present before it be born; and their tradition hands down as most praiseworthy the conduct of one of their great chiefs, who on his death-bed desired his body to be buried in the track of a caravan, that if possible his spirit in the future state might be in the way of receiving a toll from the passing merchant.

27. Warm butter mixed with honey and the seeds of the *hubbesh*, is given to an infant immediately on its birth, and circumcision follows on children of both sexes on the seventh day. The operation, performed generally by an old Galla woman, is exceedingly painful, and is often followed, especially in females, by the most serious consequences in some districts. A male child is carried in the hands of men to the Church on the fortieth day, and a female is borne by

women on the eightieth, when it is christened after the Abyssinian ritual. The right of bestowing the name upon the boy belongs to the father, whilst the mother exclusively chooses one for her daughter. A grand entertainment to the priests finishes the ceremony, and the bearers of the infant to the church are considered its Godfathers and Godmothers, and are expected to treat the child with all affection during the scenes of after-life.

28. Invariably it is carried tied up in a bag at the mother's back until it can walk; the cramped confinement seemingly produces no evil result upon the symmetry of the child, and the extra burden interferes but lightly with the severe labour which in this country is the lot of the hard-worked female.

29. Education is at a very low ebb indeed, and those children are alone instructed in the rudiments of learning, who are intended for the service of the Church, or for the priestly office. The five churches of Ankobar have each their small quota of scholars, but the amount altogether does not reach 80 out of a population in the capital of 8,000; the remainder run loose and disorderly like wild colts, until the season arrives when they are caught to be employed in drudgery.

30. After the age of 5 or 6 they are employed as servants, and set to work in the fields, and to fetch wood and water for the family, and the greater part at the age of 12 or 14 forsake the paternal residence to seek a livelihood in the service of the king or the great men, and as their pittance is but scanty, they can save nought from their wages, and are thus forced to remain in servitude during the residue of their existence. The favorite son remains with his father; begins to have some authority in the management of affairs about the age of 15; then chooses for himself a wife, and engages in the usual avocations of tilling the ground, repairing the house, and attending the king's military expeditions.

31. A girl is reckoned, according to the value of her property; and the heiress of a house, a field, and a bedstead is certain to add a husband to her list before many suns have shone over her head. In Shoa, marriage is generally concluded by the parties declaring before witnesses, that by the life of the king, they intend to live happily together, and the property of each being produced is carefully valued. A mule

or an ass, a dollar, a shield and some spears on the one side are noted against the lady's stock of wheat, cotton and bedstead; the bargain being struck, the property becomes joint for the time, until some quarrel ensues, when each taking their own, depart to seek fresh mates.

32. Men and women eat together at the same table, and most affectionately pick out the choicest morsels from the common dish, and stuff them into each other's mouths at arm's length. The appearance of the large foolish black face bending over the table, with the wide gaping mouth to receive the proffered tit-bit of raw flesh, which from its size requires considerable strength of finger to cram into the open aperture is sufficiently ludicrous, and brings forcibly to the recollection the nest of toad-like sparrows in the garden hedge at home gaping to the wanton whistle of the truant schoolboy. The meals are generally taken twice during the day, once at noon and again after sunset.

33. There exist two sorts of marriage, the one before-mentioned, and another which is celebrated by the Church somewhat in a similar fashion to our own; the parties swearing to take each other for life, in richness and poverty, sickness or health, which is ratified by partaking together of the sacrament, and by the usual oath of the country, the king's life. The inhabitants of Shoa, however, do not relish this fast binding, and the ceremony is seldom requested or performed.

34. Favorite slaves and concubines are equally respected as wedded wives, and there is no difference between legitimate and bastard children. The example set by the monarch, who in addition to his lawful spouses, entertains upon his establishment upwards of 500 concubines, is followed by all who can afford the expense; and the wandering life of the court renders the system of concubinage more agreeable, and less expensive, than the continual movement of legal wives and families.

35. The king dwells only for a time at one palace, and then proceeds to another at some distance, accompanied by all his chief officers, courtiers, and domestics. Fresh female establishments are invariably entertained at the new station; all conjugal affection is lost sight of, and these women being in time cast aside in neglect, as well as the forsaken wives, proceed in their turn to seduce the young men, and thus profligacy reigns paramount among all classes of society. There are

indeed few couples who live any time together without violating the conjugal bed, the matter not being particularly regarded, and a beating being the only punishment inflicted upon the offending party.

36. Lost to all sense of shame, many of the libertine inhabitants keep their wives and concubines under the same roof, the favorite for the time being having all authority over the rest, who submit in the meekest manner without repining to the thraldom of the degrading situation. Nay, they even declare, that it is better to have some one to talk to, even though she be the supplanter of affection, than to remain solitary in a lone house by themselves; nor are these grovelling sentiments to be much wondered at, when we consider that the jewel, chastity, is here as pearls before swine, and that the utmost extent of reparation to be recovered in a court of justice for the most aggravated case of seduction is but five pennies sterling!

37. Morality is indeed at the very lowest ebb, for here there is neither custom nor inducement to be chaste, and beads, more precious than gold, bear down every barrier of restraint; honesty and modesty both yield to the force of temptation, and pride is seldom offended by living in a state of idle dependence on others. The soft savage requires but little inducement to follow the bent of her evil passions according to the dictates of unenlightened nature, and the rules of the loose society form no obstacle whatever to the entire gratification of her vicious desire.

38. Christian only in name, the nation is plunged in a filthy quagmire of bestial indulgence, and is stiff-necked and puffed up with the most inordinate self-pride. There is little chance of their benighted minds receiving voluntarily one single ray of good to enlighten their spiritual darkness. Founding every hope of salvation in the preservation of weary fasts, in the performance of vain ceremonies, and in the belief of ridiculous doctrines, they consider that faith in the true word is but an empty sound, and that kissing the stones of Jerusalem availeth rather than all the good works which can be compassed during a long lifetime.

39. Death closes the weary scene of barbarous licentiousness, and is met with the usual stoicism of the savage. On the demise being fully ascertained, the body is washed with warm water, and wrapped up in sundry cotton cloths according to the wealth of the family, the amulets and *mahtah* of the deceased are also immersed in liquid, and being

restored to the body, all are carefully enclosed within the folds of the cloth, and secured by several new cords; then commences the frantic shrieks of the women, and the cries of the female mourners, which are of the most melancholy and distressing description, the low moaning dirge of the old women being interrupted at intervals by the hysterical sob of the principal sufferer, who is bereft of all she held dear upon earth. For a time grief is most extravagantly indulged, the cloth is torn in shreds from the bosom, and the skin plentifully scarified from the temples, whilst the moaning and wailing continue, and group after group from the neighbouring houses pour in to add their voices to the dismal coronach, which swells on high from the death hut, and incite by their ejaculations, fresh bursts of lamentation from the survivors.

40. The corpse is then carried to the grave, which varies in depth from two to four feet, and is buried with the feet towards the East, that on the resurrection, the face may be towards the rising sun. A feast to the relatives concludes the ceremony, and the dirge of mourning gives place to the notes of the violin, harpers and fiddlers generally accompanying the funeral procession of all great men, and using their utmost endeavour to entertain the returning party by their liveliest airs. Should death occur during the night, the priests are instantly called to the scene, and by the blazing light of the torch prayers are chaunted until morning for the soul of the deceased; but on ordinary occasions, the body is carried to the cemetery half an hour after the departure of the breath.

41. A small quantity of *loban* is often deposited in the grave, together with the book called *sefafa zedick*, and the kings alone are honored with coffins manufactured of wood perforated with many apertures; these are placed on stone trestles amidst clouds of frankincense, and kept in this situation until the body becomes dryed up, when the coffin is removed into the mausoleum, the walls of which are generally bedaubed with pictures, intended to represent the hunting and military actions of the royal occupant.

42. Priests alone possess the right of interment on the eastern side of the church, four paces from the porch. The aristocracy occupy the North, and warriors, women and children the South and West. All who die of *syphilis*, without confession or absolution, are either interred by the wayside, or in unconsecrated ground. Governors, men

of rank, and all wealthy commoners who have not, during life, worked in wood, iron or precious metals, are covered in the grave with the green branches of juniper; but smiths and artificers being looked upon as sorcerers, every care is taken to keep them under the ground when once deposited; great stones being heaped over the body, and the earth well secured and trampled afterwards under foot.

43. The funeral of an individual of reputed sanctity is attended by numbers of the priesthood with the great umbrellas of the Church, wherein the corpse is placed for a time, and surrounded by twelve lighted tapers betokening purity of life, which when nearly consumed are, lowered with the bier into the sepulchre. Ecclesiastics occasionally enjoy the privilege of a last resting place within the precincts of the sacred edifice; the pall consisting of a piece of printed Surat chintz is supported by six bearers, who wave it alternately with a fanning motion' whilst a numerous train of mourners follow amidst loud wails, with their hands clasped behind the neck, in token of the triumph obtained by death over sin.

44. During forty days, requiems are daily chaunted for the soul of the departed, and charity in proportion to the estate left, is distributed both on the day of interment and on several succeeding anniversaries. Oxen and sheep are freely slaughtered at the *tes-car*, or funeral feast, and all who choose to attend receive their portion in honor of the deceased.

45. Black or yellow garments, or ordinary dresses steeped in mire are worn indiscriminately as weeds—the period of mourning extending to one year; and on the death of a friend or relative, male or female, both sexes scarify the temples by removing a circular piece of skin, about the size of a sixpence from each, with the nail of the little finger, which is purposely suffered to grow like an eagle's talon. This custom, borrowed like many others from Judaism, is generally practised throughout the kingdom; scarcely an individual being free from the disfiguring scars, although in opposition to a royal interdiction, which was proclaimed throughout Shoa, in consequence of an ecclesiastical remonstrance to the throne, representing the custom to be in direct violation of the written law: " Thou shalt not cut thy face for the sake of the dead."

46. Although three military expeditions are undertaken every year, the nation is by no means either a martial or a chivalrous one. Few

individuals are pointed out as being possessed of even common bravery, and the high honor and esteem in which they are held, evince the absence of this virtue among the rest. The principle of bullying the weaker party may be distinctly traced in every form and relation of life, and much of the mean subserviency and respect of the inferior may be justly attributed to the well-known consequences of arousing the dread anger of the superior.

47. Their system of war is entirely predatory, and consists of successively overwhelming with immense masses of men solitary tribes in the vicinity, taking the unsuspecting foe by surprise; massacring all the males of the family; sweeping off into captivity the maids, widows and cattle; and utterly burning and devastating fields, houses, and farm stock: but there is seldom any fighting; the unfortunate Galla is taken completely unaware; those who have swift horses at hand make their escape to their hiding places, and the unlucky remnant are shot down, speared and emasculated without mercy: a few only offering any resistance to the numbers who surround the devoted band.

48. A very different scene, however, presents itself when timely intimation is carried to the tribes of the destination of the locust army of the Amhara; the women and cattle are sent to the fastnesses, and the men assemble mounted on their light, active and well broken steeds. The invaders halt at the sight, for the courage of the Amhara is not sufficient to carry him into fair fight with an armed foe, and after a little skirmishing at a distance, the intruding numbers retire before the few, until some more favorable opportunity occurs of dealing the death-blow in the dark.

49. But the Gallas, from their better acquaintance with the localities of the country, oftentimes make the invader pay dearly for the spoil, and more especially when entangled in a morass these wild riders charge splashing through the swamp at full speed, and cut the bewildered Amhara to pieces. Whilst returning from a late successful surprise, His Majesty had the deep mortification on coming up with the plunder and rear division, to find his advanced guard nearly annihilated, and the bodies of ·800 of his most distinguished warriors lying trampled in the mud as a bloody memento of the successful rush of the Pagans, who were lining the tops of the surrounding hills in utter derision of his remaining force. Many of the Galla tribes, also of the Loomi,

the Aroosi and the Ittoo, still hold their own, and have by repeated defeats, taught the Amhara to beware of the close conflict.

50. The spear, the sword, and the buckler, are the national weapons, although the use of fire-arms is partially known and fully appreciated, and the king's company of fusileers is gradually increasing in number, to his own advantage, and to the consternation of his enemies; but the habitual suspicions of the monarch prevents the native from being made thoroughly acquainted with the use of the firelock, the arms being always deposited within the walls of the palace, excepting during the actual period of the expedition, and ill-judged parsimony works its usual baneful effects on the minds of the hired soldier.

51. Combining the halberd with the javelin, the spear is used both for thrusting and throwing, loaded at the butt with a stout ring of iron; it is short, light, with a keen long iron head, and well balanced, but better adapted for launching as a missive weapon. The Abyssinian, from constant practice, is well versed in its use, and after poising it for a time over his head, displays considerable accuracy of aim at any distance within sixty yards of the mark.

52. It may be generally said, that swords of civilized nations are straight, whilst those of barbarous people are curved. The Abyssinian implement, which is frequently represented in old Egyptian paintings, is very short, hardly two feet in length, very highly recurved, and fashioned out of very bad metal indeed; altogether it is a most ridiculous weapon of war, and would prove of but small service, if opposed to any of the modern inventions. After the fashion of the ancient Persians and Romans, it is worn on the right side, and is more like a short reaping sickle with the back sharpened than a sword; it is chiefly employed after the spear has finished the work of death, to complete the work of mutilation of the body.

53. The terrible effect which attended these weapons in ancient times is not to be witnessed among the dastard sons of Shoa. "The horseman indeed lifteth up both the bright sword and the glittering spear," but "there is no multitude slain," and if beat into ploughshares and pruning hooks, the metal would prove of much greater service to the nation in their agricultural pursuits, and of equal avail in braining a defenceless Galla, their only enemies acquainted with the art of

54. The buckler, resembling the Roman clypeus is made of a good tough bull's hide, or cut from the hardened skin of the wild buffaloe; it is of large dimensions and well studded with silver and brass crosses and ornaments, and being conveniently portable, can be turned with the greatest ease to ward off the threatened blow of the coming missile. Anointed and rubbed with oil, as a preservative against cracking and injury from the weather, this defensive armour is generally stowed in a cotton bag, and on the return of a triumphant army, is frequently presented as a votive offering, and hung on the vestibule of a church. When not worn on the arm, it depends from the high pummel of the saddle, and "the bull skin border of the bossy shield" protects the leg from all the crushing and kicking, invariably experienced in the disorderly array of the Amhara rabble.

55. The troops move in masses under their respective governors and leaders, and take any direction they choose, provided they do not interfere with His Majesty's particular route, or go before the state umbrellas. The king's concubines and women follow on mules immediately behind their lord and master, and a band of 30 bearers of the royal silver shields preserve the faint line in front of the confused mass of succeeding horsemen, who are kept from intruding too near the sacred person of Majesty, by the strenuous efforts of the master of the horse and his assistants, who lay about lustily with their ratans, without much regard to rank or station.

56. The striking of the royal suite of tents, which is pitched enclosed in a compound of black woollen walls, is the signal for packing up, and at the beat of the drum and the sound of the horn, the king, bare-headed as Masinissa of old, issues forth about 9 o'clock, when the mass follow in his route. On His Majesty's dismounting to proceed on foot across the meadows, all follow his example; the march is seldom very lengthy, and the household ladies' alighting from their mules is the signal for the halt; a general rush at speed takes place from all directions of the host, for the purpose of securing a good grassy spot for the bivouac, and fierce wrangling, and often times quarrels and bloodshed ensue, before the array is quietly located for the night. None have tents except the king and a few of his great governors, and like the black woollen awnings of Kedar, they are warm and of a close texture, and are kept firmly erect by loops fixed to hooked wooden pegs.

57. His Majesty is welcomed to the capital by a strain of triumphant music from every throat in the army, whilst all the successful warriors decked out in their gayest attire, and vaunting trophies dangling beneath gauntlets and bracelets of silver, careering in front, slowly progress before the royal person in a mazy labyrinth of reticulated circles. The air is rent with shrill whoops and yells, which are answered by the thrilling welcome of the women pealing from the palace and every part of the town, whilst the thundering war song is shouted from the dense phalanx closing the procession.

The priests receive their royal master with a blessing, and the unceasing clang of big drums, together with frequent discharges of musketry and artillery, fill up the pageant.

58. From the most remote ages, the glittering bracelet has been always the badge of bravery. The Amalekite, who slew the warrior Saul, took the bracelet that was upon his arm and brought it to David. In some parts of the East they are still used in the investure of gallant chiefs; and the celebrated armlet of Persia surmounted by the great diamond "the crown of the moon," is not more valued by its royal possessor, than the ring of brass which encircles the wrist of the Amhara. The gauntlet, the spoils of the lion, the armlet and the *aqua-dama*, each advance the warrior in the scale of honor and credit, and when the matted locks are crowned by the white feather of the Hirkom, or the green sprig of wild asparagus, the most frightful tales of blood proceed in streams from the mouth, and there is no deed sufficiently daring for the prowess of the braggart. But it is well known, that many are ornamented who have never proved themselves in the field, even according to their own base ideas of fight. The lie is brought to the rescue of the coward reputation, and the emblems of bravery are often exhibited, on spilling the blood of the most inferior vermin; but blood is the sacrifice demanded, and it matters little whether it be poured from the veins of the Christian or the Galla, from the elephant or from the mouse; the war song is shouted on every available opportunity, even on the accidental destruction of a rat, and all would fain appear martial and chivalrous, glorying in the name of the "bravest of the brave."

59. The principal materials employed in the most ancient crowns and chaplets were wreaths of flowers and leaves, which were afterwards

substituted by imitations in metals. The idea of the *aqua-dama* might have been taken from the tendrils of a creeper hanging in clusters from a massive branch of the Weira tree, and the ornament is certainly deserving of much praise for its singular beauty and fanciful form. A transverse bar of worked silver worn across the brow over a thick row of ornamented pendants reaching to the eyes, and branches of light chains depending at intervals completely round the head, fall in a glittering mass to the waist, whilst a worked coronet rises high above the bar, and is profusely cut into open figures and highly wrought crosses.

60. The gauntlet is generally made of silver, and reaches from the wrist to the elbow, and the armlet is an unmeaning hollow ring of silver, resembling in size and clumsiness rather a manacle to secure a wild colt, than an ornament for a Christian man.

61. The travelling equipment of a man of rank is very simple indeed, and a few attendants or a sumpter mule suffice to carry all requisites for the journey. His wants are but few—a loaf of bread and a horn of mead for his sustenance, and a skin for his bedding; the cotton robe serves him for covering by day and by night, and he can always find some shelter at the end of the march, which is little inferior to what he had been accustomed at home.

62. Ambling along upon his mule gaily bedecked with bells and brass ornaments, with a running footman on each side, he takes the road early in the morning, followed by a party of retainers according to his means. Immediately behind his person, the confidential shield-bearer takes precedence, his steward rides nearly abreast to hold a share in the conversation, and the remainder of the train, some with load and on foot, but all armed with sword and spear follow, as they choose, a noisy motley group, without order or regularity. They are, however, attached to their master from long service and kind treatment, and in many ordinary transactions swear by his name, instead of that of the ruling monarch.

63. A stage of 25 or 32 miles is considered long, and indeed the high hills to be ascended, and deep valleys to be crossed, render it wearisome to traverse even that distance; the general pace is the common step of the mule, about 3 miles an hour, but when the road is level, the amble is increased to 5, and those on foot are accustomed to keep up with the mounted party. A saddled horse is often led in the train, a custom

handed down from the former generation, when the country was not in such a settled state as it is at present, and when the traveller was obliged to keep a weary and vigilant look out for parties of roving Galla, and to give battle on the moment, if the occasion required; but Sabila Salassie has wonderfully improved matters during his long reign, and now, if provided with the necessary royal permission, an unarmed man can pass through any part of the hereditary dominions of Shoa, without scath to limb or property.

64. As the king's guest, the traveller is in general treated with some degree of respect, which is, however, entirely owing to the despot's wishes, and the fear of consequences unbars the door of the house and throws open the stores for the consumption of man and beast; but a churlish reception would most probably await the unfortunate who travelled through the country without the king's permission; and a well-stocked purse, or a well-filled portmanteau, would not invariably produce a salutary effect, as the savage has always some plan or idea in abeyance, to obtain any curious article exposed to his admiring view, without the necessity of imparting aught of value in exchange. Under every advantage, and attended by the king's household officers, it is extremely difficult at times to obtain the most simple and necessary supplies, and force is frequently resorted to, to extract these articles for which the most liberal payment has been tendered beforehand; but there always exists along with the desire to acquire property, an innate dislike to part with aught the most trifling, and even among the higher classes, the small request of a stick or a spear is peremptorily refused to parties, who have heretofore loaded the ingrate with the richest imaginable presents.

65. A great man on coming to the capital if unprovided with a house of his own, is certain to find ready accommodation always with the inmates of any of the lower description of dwellings, who are all willing, for a trifling consideration, to remove their bullock hides, and allow the grand visitor the free use of the apartment, such as it is. They will also cook the victuals of the stranger and his followers, if of the same religious persuasion as themselves, and remain content with a very small remuneration indeed.

66. His Majesty, however, in general, has tents pitched for all great men, and liberally supplies them with food, both at his own table and in

the presentation of the '*Dingo*,' an established allowance granted from the royal kitchen, bread, mead and pepper, soup daily, and sheep and bullocks being occasionally distributed to upwards of a thousand people, who are on the list as masters of *Dingo*. Every stranger who comes to the kingdom is amply provided for, and indeed all who make their necessities or their wishes known on the subject, have no reason whatever to complain of any want of liberality on the part of the sovereign of Shoa.

67. From the excess of cultivation on the table land, there are few wild animals, except hyenas, hares and field rats; the death of an otter is considered a rare feat of prowess, and badgers are avoided as the 'devil's sheep,' and the few that burrow in the hills are viewed with very great distrust. Partridges and guinea fowl are hunted down with dogs placed on successive ranges, who, fresh from the nearest station, pursue the quarry the moment he finishes his fight, and very soon pick up the wearied bird. In the low country, the larger animals, elephants, lions, buffaloes, rhinoceros and many species of antelope exist in considerable numbers, and as each has a relative value in the scale of honor reckoned according to Galla heads, the brave warriors on the frontier do contrive, at lengthy intervals between, to compass the death of some.

68. A large body, consisting of several hundreds proceed on horseback to the cover, armed with every available weapon, and worry the animal to death according to the usual approved system of Abyssinian bullying, riding after him till he is brought to bay, and pouring showers of bullets and lances from a distance into his carcase on the first convenient opportunity; but these hunts are often undertaken without success, and seldom conclude without many fatal accidents. The valiant thrower of the first spear is entitled to the honorary reward from the king at the triumph at entry into the capital, which is attended by the same ceremonies and rejoicings as the advent of a successful military expedition against the heathen Galla. The elephant is reckoned equal to 40 Galla, the lion to 7, and all the other large animals to 5 Galla, killed in battle.

69. A good equestrian, and a tolerable marksman, His Majesty is in the habit of making Saturday excursions attended by many hundred followers to some favourite retreat, where he remains for hours, shooting what the country chiefly affords, *i. e.* baboons, vultures and wild ducks;

but the Amhara has altogether a very indistinct idea of woodcraft. One of the chiefs burning with the desire to emulate the white men in the distinction of an elephant, lately proceeded to the jungles with a retinue of 1000 adherents, and a large party of the king's gun-men; but after fruitlessly spending a month in the covers, he was fain to return without having destroyed any thing of larger dimensions than a spotted monkey. Hyenas are suffered to multiply to a great extent in some parts of the country, owing to the superstition of the natives, who firmly believe that Jewish sorcerers descend from the mountains during the night, and transform themselves into the likeness of these foul animals, and that in consequence, there would be no good result in the pursuit.

70. The bulk of the nation is indeed decidedly agricultural, although it appears somewhat strange that the minds of the people are not more disturbed and upset by the continual military expeditions they are forced to make against the Galla. Probably the selfishness of the despot in appropriating the lion's share of the spoil has most salutary effect in checking innate restlessness, and the Abyssinian is taught in a rough school to understand fully, that there is more profit to be obtained from holding the plough than from wielding the sword, and it is certainly the fact, that when the foray is over, the war horse is turned loose in the meadow, and the partisan willingly applies himself, according to his means, as usual, to his peaceful avocations among the fields.

71. Mounting on the left side with the assistance of their spear, the natives when seated do not by any means ride well, though they do not very often tumble from their horses or mules, owing to the high fortifications of wood and leather which are built upon the saddle to protect the rider in front and rear; and although they can carry a horse at speed over bad ground, their seat is awkward and ungainly, and they have no idea whatever of easing an animal in his distress. Bitted in the most cruel and barbarous manner, they bear as heavy as lead upon the bridle rein, and no horse is ever five minutes in the hands of an Amhara without having his mouth pulled to pieces, and the blood streaming as the tortured animal tosses his head in the air for relief.

72. The sojourner in Abyssinia can easily believe what Bruce relates concerning his recorded instance of cruelty to animals, for although it is not fair to brand the nation with a foul stigma resting on a solitary fact, yet there is no good reason to disbelieve the veracity of the traveller;

and other facts have been also witnessed which exceed in horror even what has been related of the soldiers of Northern Abyssinia. On the first military expedition to which the British Embassy was invited, on the evening of the successful foray, the limb of a sheep was most wantonly severed from the live animal with a sword when the wretched beast refused to proceed further, and the mutilated trunk left bleeding upon the ground, to be hacked piece-meal alive by any in the rear of the column of savages who had no store of provender. That the flesh might have been served up quivering with the life-blood is also extremely probable, though it might not necessarily have been taken from the living beast, for the animal is invariably killed at the very door of the eating house, and it takes but a short time after the breath is out of the carcase to hand up the raw meat to the feast. Whatever might have been the custom 80 years ago, now-a-days, the animal is invariably in the first instance killed after a fashion.

73. A rush of 10 or 12 men is made on the victim, his legs and horns are seized as a purchase, he is thrown upon the ground, when the throat is hacked through with a blunt knife in the name of the Holy Trinity, and the poor beast is left to struggle and stagger about until the lifeblood be expended; then commences an indiscriminate onslaught of knives, swords and hatchets, without the preliminary operations of skinning and cleansing. Bigotted to a degree, the animal if killed by the hand of a Moslem is considered in the highest degree impure, and reckoned on the list of even lower esteem than the unhallowed flesh of pigs and bears, geese, and wild fowl.

74. The Abyssinian in general is too well acquainted with the value of his own live-stock to urge him beyond his powers unmercifully, and often performs a great portion of the journey on foot rather than distress the animal to his own loss; but his treatment of Galla prisoners, and the almost certain dreadful fate which awaits any old or useless male who falls into his hands, is a sufficient blot upon the Christian name, without the addition of any other crime whatever.

75. Here, as elsewhere, eating is one of the most important concerns of life, and on the days of the great festivals, the palace displays all the pomp remaining in the land, and the unusual sight of the population somewhat aroused from their customary state of lethargic bestiality; the stair cases are lined with groups of priests and monks in their holiday

suits, and the courts are filled to overflowing with the chiefs and nobles, who on these gala days cast aside their abhorrence for the use of water, and appear dressed in clean white robes.

76. The king reclines in state on his best velvet cushions, and the royal alcove is tricked out with gay gold cloths and massive silver ornaments; seated on the ground immediately before the presence, are his most devoted and valiant governors, and around his couch swarm a group of young pages, the tableau being most probably taken from the Old Scripture pictures, where cherubs are so profusely introduced surrounding the principal figure. A long line of attendants stretching on either side of the throne stand as fixtures against the walls, each bearing in his right hand a straight silver sheathed falchion. The room is of large dimensions, and the height and gloomy ceiling in some degree compensate for the absence of architectural decorations, whilst the lofty walls are relieved by a display of all the state shields, which are profusely studded with silver bosses, crosses, and ornaments, and depending from each buckler the velvet mantle droops gracefully by its side, glittering in every hue and color of the rainbow.

77. At an early hour, a horse-shoe table is extended the entire length of the dwelling, and is so entirely heaped with viands, that not a twig of the wicker work is visible beneath the load. Piles of wheaten cakes touching each other, and strewed with fragments of fowls, tower up two feet above the surface. Bowls of rich curry, decoctions of red pepper, flanked by bottles of old hydromel, heap the groaning board, and numerous slaves are ranged at intervals with large baskets of delicate raw flesh, which has been just stripped from the slaughtered bullock.

78. The preparations for the feast are completed by 8 o'clock in the morning, when the great doors are thrown open, and a burst of wild music from the king's band ushers in the company; four hundred sit down on the floor at a time, ranged in double row besides the table, the chief men in the front rank, and every justice is done to His Majesty's hospitality. The piles soon sink beneath the active attacks of the guests, and the rising hum proclaims that the hydromel is of the most potent quality. Numerous attendants are in waiting to administer to the wants of the honored guests, by handing with their fingers from the viands whatever is desired, and a piece of meat if not relished by the first person into whose hand it falls, is passed to the next inferior,

and thus runs its course down to the individual, whose rank incapacitates him from rejecting the proffered morsel.

79. During the repast, the fiddlers and harpers who are stationed in the opening of the horse-shoe, dance and sing to the notes of their instruments, and ever and anon the shrill notes of some "Asmaree" stationed in a corner of the hall, rise thundering to the very roof, in acclamation of the generosity, hospitality, and magnificence of the great emperor of the Amhara.

80. After the guests are fully satisfied with food, the company rise, and each being provided with a large horn of mead, lounges against the walls to complete the inebriation which has been but partially effected at the table, whilst crowds of well dressed female slaves speedily replenish the diminished structures of food and liquor.

81. The great doors are again thrown open, and a fresh set enter amidst the increasing din, and the entertainment is continued till late in the afternoon; etiquette enforcing on these occasions the presence of the monarch throughout the entire time. Hundreds of bullocks are devoured, together with many more measures of wheat than can be well conceived; but altogether considerable decorum is preserved, and although the guests reach a maudlin state of drunkenness, yet the presence of the king is generally respected, and the exuberance of incited mirth expends itself in harmless praises of the royal host.

82. Such, however, is not the case at private parties, the crub of erstraint is allowed to fall loose, the fierce passions gain along with the liquor the entire ascendency, and guests seldom return to their homes, without witnessing the broil and the scuffle, the flashing of the swords, and the dealing of deep cuts and wounds among the drunken combatants.

83. Sunday is the great day for feasting, and is universally believed to have been designed for the express purpose of eating and stuffing. Men do not labour in the fields, women abstain from grinding and sewing cloths; and although other work is carried on as on ordinary week days, the chief employment for all who can afford it, is to pass the entire time in eating, drinking, and sleeping.

84. The influence of the evil eye is supposed to have little or no avail within the palace walls, and the great door is suffered to remain open during the operation of eating; but elsewhere it is scrupulously

barred and closed, and a fire is invariably lighted before the peasant, who will on no account appease his hunger, labouring under the strange superstition, that otherwise the devils would enter during the dark, and that there would be no blessing upon the meat.

85. It has been conjectured by Pliny, that the orientals received their first hints of building from the swallow, and that in imitation of their feathered instructor, their first attempts were made in clay. Where the Abyssinians obtained their ideas on this subject it were hard to tell, but certainly they have made little progress in architectural design, and their houses, constructed as in the earliest day, are still mere frameworks, sparingly daubed over with a thin coat of mud. Here thieves can easily break through and steal, and the materials are of such a flimsy nature, that the morning sun oftentime rises a witness to the truth of the scriptural metaphor: "He built his house upon the sand, and it was swept away by the rising flood."

86. Of the rudest description, these hovels are composed of mud and rotten twigs, and perfectly pervious to the inclemencies of the season, they subject the occupants, from the cold damp air, to all the pains of rheumatism and catarrh. There are no conveniences in the shape of glass or other transparent substances, and if the door be closed on the dense unhealthy fog and the cold bleak wind, all possibility is denied of admitting light; the thermometer rarely rises above 65 degrees, indicating the necessity for artificial heat, whilst there exists no vent for the smoke, excepting through the door and the cracked apertures in the walls.

87. In the town, from the want of sewers and drains, the inhabitants are obliged to live like swine in the filth of their own styes, inhaling all the effluvia of decomposing matter and putrifying water; the comfort of space is never consulted, passages and out-houses are far beyond the intention of the proprietor, and with doors allowing full ingress to injurious currents of air, with roofs admitting the rain, and floors covered with unwholesome damp, it is surprising that many more of the inhabitants are not made martyrs to disease. Some few years ago, epidemic dysentry made its appearance at Ankobar, and as might have been expected, rioted to excess in the foul location. One-half of the population was swept away, and the remnant fled for a time from the hill, which they declared to be blasted by a curse from heaven.

88. In the country, there is no attention whatever paid to cleanliness or comfort. The stagnant dunghill is carried by the descending rain but a few yards from the walls, and the cattle and poultry are allowed to share the general apartment; misery and confinement are strikingly pourtrayed in the worn-out thatch and the wattle stockade which surrounds the farm steading, whilst the inmates themselves, although supplied with an ample sufficiency to sustain the mere necessities of life, exist amid dirt and vermin, without experiencing much comfort even in the moments of their very highest enjoyment.

89. It is the practice of this uncivilized country to keep the demise of royalty a profound secret so long as possible, in order to avert the anarchy and confusion that would not fail to occur during an interregnum, when every individual in the kingdom considers himself at full liberty to act according to the best of his imagination, without fear of punishment. Whilst there is no king there is no law, is the maxim in Shoa, and the foulest crimes are committed with the most perfect impunity. On the news of the death of Assfawoosun, the streets of Debra Sibanoo ran red with blood, and 800 victims were immolated to private malice and revenge, before the appointment of his successor was proclaimed, and justice and order re-established on their seats.

90. At other times also, the great Christian maxim is too apt to be forgotten. The Abyssinian remembers only that he is savage, and revenge, as usual, takes up the first position in the mind. Many a dark deed has been cowardly enacted in the deep forest or in the confused skirmish, and the Gallas have been oftentimes most wrongfully accused of foul murder and death, when the victim has fallen under the assassin spear of his false comrade; and indeed the rulers and leaders of armies are on this account always much disinclined to lead their forces through difficult woods and defiles, being well aware of the dread effects of Amhara treachery.

91. It is deeply to be lamented, that any nation whatever should esteem even the heads of the slain as the great emblem of victory, but the more atrocious and disgusting barbarity of Abyssinia, the base idea of which is so revolting to humanity, is the filthiest ceremony that ever disgraced any styling themselves a nation. The frailty of human nature is indeed discernable in the most legible characters, and he who witnessed the unhallowed proceeding cannot fail to offer up a fervent wish,

that the time may be hastened when nations shall be knit together in the bonds of love, and when true Christianity shall reign triumphant in every heart.

92. On the close of the foray, each follower who has slain a male creature;—*murdered* would be the proper expression, for the grey hairs of venerable age and the tottering step of smiling infancy prove no safeguard to the ruffian monster;—proceeds to mutilate the body, and carries off the token of his crime carefully preserved in the bloody folds of his waist cloth. The disgusting trophy after being prepared over the fire is hung dangling to the right wrist, and on the following day, each in his turn presents himself before the approving monarch, who halts at intervals at the time of march for the purpose of witnessing the foul exhibition. Group after group, dash in from the flocks, resounding their war song in chorus, and whilst brandishing their spears and their vile trophies, the lying murderers shout their prowess aloud:—" I have destroyed my enemy in the open plain, I have rushed upon the foe, and slain him in the wood. I am the king's great soldier, may Sabela Selassie live for ever." After the savage Christian has fully displayed his wanton cruelty he sinks prostrate to the ground, and by his mean grovelling subserviency, fills up the full measure of Abyssinian iniquity.*

93. All proclamations are made after beat of drum by the king's heralds on the outside of the palace gateway, the removals and appointments of governors, the promulgation of religious doctrines, and His Majesty's commands on all general subjects; but the order of assemblage for the military expeditions issues forth in pithy language from below a small stunted tree at the foot of the palace hill of Angollala.

94. " The king hath foes and is about to subdue them on a certain day, who fails to present himself at Zallo, armed and carrying provisions for the specified time shall be treated as an enemy, and shall forfeit his property during a period of seven years." The penalty, however seldom requires enforcement, all the Amhara respond to the call with the ut-

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* This horrible custom if not borrowed from the Jews, is probably of Galla origin, and is early mentioned as being practised on the coast of Africa, vide De Bry, 1599, De Caffrorium militio. " Victores, victis cæsis et captis pudenda excidunt quæ exsicata, regi in reliquorum procerum presentis offerunt." This is a very ancient African custom. It is represented on the walls of the temples and tombs in Egypt. See the French Institute's " Description de L'Egypt."—Eds.

most alacrity, for the insatiate love of blood and the inherent hatred of the heathen are sufficient inducements to quit home and family, and follow to the foray the great crimson umbrellas, in which they place the most unbounded confidence.

95. Every thing, however minute which is found by a subject, is carried straightway to His Majesty. The brass bowl of a pipe and a bottle of lunar caustic which were lost during the expedition were forthwith brought in by the finders, and restored. On his way to Angollala, a servant of the Reverend Mr. Kraff was swept away by the torrent in the Mosaliet river, and a tea kettle which he carried was lost; six months afterwards the utensil was found by a woman and taken to the king, who on being asked for it, said, "No, it will do for myself."

96. All presents received by the subject are also immediately carried to His Majesty for inspection, and it rarely happens that the individual is suffered to retain any part whatever. Brought before the sovereign as a peace-offering, the budget is generally received with an "*exogeer casto,*" "God give you more," and forthwith transferred to the storehouse of finery which has been filling for ages. The more trivial portions of the present may be sometimes granted to the receiver as a wonderful mark of the monarch's favour; but in all cases, an equivalent in cattle or country cloths is afterwards made from the royal stores.

97. On the occasion of any loss by fire or other accidents, the begging sufferer makes the round of his acquaintance, who each contribute their mite to the subscription, and wonderful scope being given to imposition, the individual becomes more wealthy than before. Constant application is also made by the domestics of the royal household to obtain the price of destroyed articles, in order to save them from condign punishment. An offender was detected in bringing the same broken decanter three times over, and a shield was never said to have been broken or a mule lost, but the delinquent did not refer himself to the embassy for the amount of the fine.

98. Tainted with base servility, the Abyssinians pay the most abject respect to their superiors, and however aggrieved, are seldom heard to complain of the governor. The king is held in the highest adoration, and the oath by his life is the most binding in use. If adjured by this a person can be punished for non-compliance, and the wilful breaking the obligation renders the perjurers liable to severe penalties.

In addressing equals or children, the second person singular is used. Superiors are entitled to the third person plural, and disputes are easily excited, especially among the fanatic priesthood, by not paying sufficient attention to this point of etiquette.

99. Respect is here paid by prostration to the earth, and after the most degrading and humiliating fashion, bowing the face among the very dust, by uncovering the robe, and exposing the naked person, and by kissing the nearest inanimate object on entering a house.

100. The most grovelling adoration is paid to the monarch, and to many of his chiefs. All of whatever rank when they approach the presence, throw themselves prostrate upon the ground, lie flat on their faces, and knock their heads three times upon the earth. The inhabitants bend in the mire at the approach of His Majesty, and the troops of horsemen as they emerge from their different districts to join the military expedition before mingling with the general mass, stream at full speed to the vicinity of the royal umbrellas, and pulling up at a prescribed distance, spring from their saddles, and all simultaneous leaders and followers perform the degrading prostration.

101. Every native uncovers his person when in presence of or in conversation with the king, whilst to equals the corner of the robe is only removed for a time, and then suffered to resume its fold over the shoulder. Inferiors are obliged to stand continually unclothed in the company of their masters, and any small present bestowed upon the servant, must be received with both hands in a cringing position, whilst the nearest object, generally the threshold of the door, is kissed in token of devoted love and affection. Suspicions of treachery and revenge may have possibly originated this strange custom of uncovering the person, and the concealment of dangerous weapons is totally debarred, when the law is enforced of making all strip themselves so often during the course of the twenty-four hours.

102. Although not particularly addicted to the merry mood in general, and exceedingly ignorant withal of any thing resembling stage effect, yet the palace buffoon elicits shouts of laughter by his uncouth antics, and attempts to personate the character of the adjoining tribes, who are looked down upon with the utmost sovereign contempt; and on the days of interview with these wilder savages, who come dancing into the presence chaunting their war songs, and decked out with feathers and

warlike implements, the buffoon mixes in the dance and delights the Amhara spectators by the performance of his caricatured gestures; but in this department the country can only boast of the king's mimic, who retains his situation without fear of rivalry; here there is no field for genius, and it would prove a hard task for the jester to devise any thing more ludicrous or ridiculous than the ungraceful dance of the Amhara, the impassioned caper of her priests, or the idiotic whirl of her warriors.

103. Following the custom of the dark ages, dwarfs are treated with considerable fear, respect and consideration, and many of the most learned and praiseworthy in the land are to be found among the small misshapen race. The king's father confessor is of the most diminutive size, though possessed of great good feeling, and forming a striking contrast to the generality of his nation. The chiefs and nobles often choose their secretaries and household priests with reference to their tiny appearance, and the wisest man in the capital, whose charms and talismans are considered all powerful, and who knows every plant by heart from the "cedar of Lebanon to the hyssop that creeps over the garden walls," sustains his character for lore, as much by the deformity of his appearance, as by the brilliancy of his understanding.

104. No petitioner ever enters the presence of his superiors unless furnished with an offering according to his means, as a bribe to propitiate favor and good-will. Cattle and honey, cloth, wood and money, and even stones being presented when building materials are scarce.

105. Presents are frequently exchanged among the chiefs and great men, and every display is attempted on the occasion, the train of bearers being lengthened out as much as possible by dividing the articles into the most minute portions, and all are covered with red cloth; every thing must also be exposed to the view of the receiver, wild bulls and unruly he-goats, as large as donkeys, are dragged into the sitting apartment to the imminent danger and pollution of all around. Cocks and hens, loaves of half-baked bread, and pots of rancid butter, must be all closely investigated and personally approved of, and any deviation from this rule is certain to be visited with the most dire displeasure.

106. An easy and ingenious method of extortion exists in full force throughout the land, and all classes are equally amenable to its abuses

and privileges. Bringing any article whatever, the begging petitioner hands it over to his superior as a "*mamalecha*" or memento, for whatever he has the assurance to demand. Servants bring a stick or a bunch of grass, and ask for swords, clothes, and money; and chiefs and officers of the state present to His Majesty a pot of honey or a cotton cloth, and demand a horse or a mule, or an embroidered garment. If the *mamalecha* be received, the modest request must be acceded to, and indeed the custom of the country imperatively requires that the extortion should be invariably complied with.

107. With the first dawn, bands of petitioners station themselves on the top of the eminences adjacent to the palace, and the cry of "*aliet,*" "*aliet,*" "master," resounds deep in the still air of the morning; the door-keepers order them to draw nigh, but well aware of the understanding between these servants and the "four chairs," against whose decision they are appealing, they give no heed to the summons, but lift up their voices the louder, until the king orders one of his pages to cause the whole to assemble in the court-yard. At home and abroad, on excursions and military expeditions, the cry of "*aliet*" salutes the royal ear from the most strange and unexpected situations, and is in general, promptly attended to; the stick, however, is sometimes applied to the most importunate, who will not remain content with the promise of a future consideration of their claims, but every available opportunity is taken by the king of listening to these endless petitions and appeals. The halting stones on the green turf are frequently transferred into seats of justice, judgment is given whilst ambling over the fields on private excursions, and three-quarters of the entire day, with the exception of the Sabbath, is devoted to unravelling the knotty points of controversy, or settling the disputes and quarrels of his subjects.

108. In Shoa, the men have the entire responsibility in all the bargains regarding cattle and sheep, farming and warlike implements; and the women barter in the minor articles of sustenance, grain and pepper, salt, ghee and earthenware. And although the man cannot carry the water or bake bread, he must wash the foul linen belonging to both sexes, an operation which is performed in the running stream, the clothes being deposited in a skin together with the seeds of the *indote,* and well trampled under foot. It is the province of the men to plough, sow and reap, split the wood, cut the grass, and repair the house;

whilst to the women all the other heavy work is accorded, as fetching wood, water and grass, making butter and bread, spinning, pounding and grinding. Markets are held once a week in various parts of the kingdom, and the weekly supply for household use is then laid in. Men and women indiscriminately attend, each occupied by their own peculiar duties; at other times in all the towns and villages of Abyssinia, there being neither open shop or bazar, the Owenian system of barter entirely prevails, and the proprietor of any article who wishes an exchange perambulates the streets, calling aloud from door to door the nature of his goods, until he finds some individual willing to make the desired barter.

109. Love rules neither camp nor grove in Abyssinia, but base sensuality is indulged in by the grossest indiscriminate intercourse. A permanent female is sought for as a household drudge, the child is delivered over into bondage without any reference to her own wishes, and remains with her mate only until she can better her miserable condition elsewhere.

Women of rank, however, and more especially those of royal blood, assume high grounds and pretensions, for the honor has been conferred by linking with the lot of the subject; the reins of authority are generally taken violent possession of, the order and the command issue in the name of the lady, and the hen-pecked husband on whom the alliance has been thrust, is obliged in his own establishment, to endure in peace all the despotism of the palace.

110. In all matters of quarrel and dissension, should either of the parties desire to be reconciled, the matter cannot be adjusted without the intervention of a mediator; a third individual is sought for, who will undertake the arrangement, and in his hands the affair is entirely placed. The king himself often accepts the office, and of course is rarely unsuccessful in his applications. Inferiors come into the presence of their offended masters with large stones upon their heads, and prostrate themselves upon the earth in token of their fault, which, however, is generally forgiven on the intercession of the mediator. Quarrels between man and wife, if not allayed with the cudgel, or of that serious nature to cause separation, are settled by arbitration; the neighbours assemble to discuss the matter, a judge is instituted for the occasion, the parties are mutually examined, and a fine is imposed according to the

merits of the case: a string of beads, if the husband be in fault, and a pair of new breeches should the lady be found napping. A woman supposed to be unfaithful to the conjugal, "*alga*," may be returned to her friends with a portion of her property, but one caught in the act of infidelity can be well beaten, and ejected stark naked from the house; these extremities are seldom indulged in, and mutual forbearance seems to reign paramount in Shoa.

111. But this universal loose style of living exercises a most baneful influence on society in general; the mind becomes degraded, whilst the body is enervated by disease and indulgence; jealousy is rife in every house, and the children of each separate female on the establishment are bandied against each other in all hatred and animosity, which is by no means allayed on the death of the parent, or by the posthumous intimation of his partial and unfair distribution of property.

112. On all occasions of rejoicing and ceremony, whether on the successful return of the king or of a private individual, on the sight of a procession or on the discharge of fire arms, the women with their characteristic love of noise, burst out into the most thrilling clamour of welcome. Moving their tongue with more than ordinary volubility against the roof of the mouth, they produce continuous successions of shrill notes, which are more agreeable to the listener than to the performer. One watchful dame on the outskirts perceives the approaching cavalcade, and forthwith gives out the clamorous note of warning; in a moment the entire mountain side is covered with every female in the location, yelling in full chorus; the *hillil—lil* progresses fast and furious, as they bend their bodies nearly double to assist in upraising the melody of the tone, the tears stream from their eyes in the violence of the exertion, and the hills resound far and near with the gathered volume of the shrill notes.

113. One of the strangest of Shoan customs is the method of salutation; the most earnest enquiries being invariably made regarding your own health and that of your house, horse and children, as if the enquiring party was really interested in the result. Even two old women tottering on the very brink of the grave, and afflicted with every pain and sorrow under the sun, meeting in the street, pull up and commence a string of good wishes, which are reiterated as long as the breath will come out of their old bodies. How are you? How have you passed

your time ? Are you well ? Are you very well ? Are you perfectly well ? together with a thousand other pert interrogatives to be made acquainted with their private condition, and at each response the Deity must be invoked as to the great happiness and perfect felicity which have been experienced since last sight. Should the meeting take place twenty times a day the same ceremony is enforced, and for each progressive state of morning, noon and eve, there exists a distinct set of phrases, which from their continual repetition sound grating upon the senses. Passengers stand in the streets and roar out salutations intended for the inmates and huts a hundred yards from the hedge. You are startled from your sleep by a dunning—How are you ? from some gentleman passing before day dawn to his country residence, and your ears are afflicted from morning sun till evening, by a most teasing and harassing string of enquiry, from every one who passes himself off as an acquaintance.

114. The *buldurba*, or introducer, is appointed from amongst the retinue of every one who keeps an establishment, on the first introduction of the parties. To him, and to him alone can the visitor look for admittance into the house, and unless he is present, the monarch and the great man are alike invisible. Court-yards may be thronged with many attendants, and doors may seem invitingly accessible ; but the "open sesame" is wanting, and the stranger returns to his own abode disgusted with the insolence as well as inconvenience of the custom. Time, however, softens down the rigidity of the practice, which is at first so pertinaciously observed ; suspicion of evil intention gives way, on better acquaintance of character, and after a certain probation. There is much more difficulty experienced in gaining admittance into the lordly Abyssinian hut than into the lordly halls of an English nobleman.

115. Suspicion may also be easily traced in the custom of all great people moving from their domiciles with a long train of armed attendants, as in the height of Highland anarchy. The tail of the McGregor was seldom of longer dimensions than that of an Abyssinian nobleman. Indeed he is never allowed to be by himself, whether in the cabinet or in the field he is invariably surrounded by a numerous band of mean sycophantish attendants. The custom of the country enjoins the practice, the cheap price of provisions enables him to feed a large population and the lack of all manufactories, supply an unlimited number of idlers, who are willing to obtain a livelihood in any manner whatever. But the

nuisance is a crying one to the stranger. No privacy is ever enjoyed. No retirement is ever suffered. A dozen naked savages are continually by your side, restrained by no very correct ideas of order or discipline; the confused hum and suppressed chattering are by no means of assistance in study or writing, and on the occurrence of meals or of the visits of illustrious people, the whole establishment tumble in naked to the waist to satisfy their own inordinate curiosity, and to do honor to their lord and master.

116. Visits are generally made early in the morning or before noon, and it is reckoned discreditable to enter a strange house after meals, as the object of the untimely advent can only be attributed to a desire of obtaining the food and refreshment of which the etiquette of the country enforces presentation. Sneezing is accompanied by an invocation to the Trinity, and the bye-standers are expected to exclaim "*moroo,*" God bless you, and eating is invariably attended by a loud smacking of the lips, which can be heard at some considerable distance from the entertainment; none but beggars eat their food in a quiet and rational manner.

117. There is no sense of decorum evinced in the satisfying of any desire, however gross, and no shame whatever is felt in exposure to the gaze of the public. The toilet is unscrupulously performed in front of the assembled multitude, and his Majesty himself, the most polished gentleman in the kingdom, blows his nose with his fingers, and wipes the soiled hand upon the robe of the nearest courtiers, who eagerly proffer the cloth for his acceptance. More offensive than the Amaponda, who carries his own little cleansing spade tied round his neck, the first object is seized by an Abyssinian upon entering a strange house, and ears and nostrils are scraped out with the most savage indifference to appearance. All sleep stark naked, stretched upon bullock's hides, huddled close together for mutual warmth, each loving batch being covered with the accumulated pile of individual garment. Should the master of the house require food during the night, a piece of raw meat and a horn of beer are brought to him by a male or female attendant, who, destitute alike of clothes and decorum, stands unconscious of all shame until the craving of his hunger be satisfied; and owing to their foul feeding and their more uncleanly habit of never washing, cutaneous eruptions spread like a plague over their unsavoury persons, and few indeed are free from the disgusting diseases of the beggar.

118. Their amusements are few indeed. At rare intervals, shooting vultures and monkeys in the woods, or running down partridges among the hills with their dogs, throwing the spear on foot at a mark, or mimicking the art of war on horseback, moving in the uncouth dance, or singing the war-song in chorus, whilst the games of ***gibbeta*** and ***shuntridge***, and the annual throwing the ball at Christmas, fill up the scanty list.

119. The spear is generally launched at a short distance, and the unsuccessful competitors are obliged to lay down with their faces upon the earth, whilst all the better marksmen trample and triumph over their prostrate necks ; and in the "*yombeza*," the mounted warriors with blunt lances choose a spacious plain and perform at speed all their evolutions of war, attacking and defending, throwing the reed and receiving upon the shield, and whooping and yelling to proclaim the victory, the delivery of a sure spear thrust, or the hemming among their own number, one of the opposite band.

120. The "*gibbeta*" is a game somewhat resembling back gammon, but is played with sixty pewter balls, which are stored in 20 holes over the board; the distribution of these balls and the judicious heaping up of the stones according to certain complicated rules, constitute the science of the game, which is, however, sufficiently intricate to foster a spirit of betting and gambling, which reigns in full force amongst the nation.

121. *Shuntridge* is nearly the Arab game of chess, but the board and the men are very miserable productions of genius; a few of the moves are somewhat different, and the game is almost entirely confined to the court eunuchs, who bask their portly forms in the verandahs of the palace, and pass away their idle hours in very indifferent play.

122. On the Christmas, an annual contest takes place between the king's household followers, the dependents of the purveyor general, and the Deek Agavari. A cloth ball is struck with a mallet, and a struggle ensues for the possession of the missile; three times the ball is discharged over the plain, and the party are declared victors who have thrice caught it in succession. They enjoy the privilege for the day of abusing the vanquished, the king only excepted; every tongue being unloosed and the foulest abuse and slander being heaped upon the most illustrious as well as the holiest personages of the court. The day is

concluded by a grand entertainment to all, at the cost of the chiefs of the defeated party.

123. The king's band is composed of simple reeds of various length and sizes, the "*imbeta,*" having in the upper part an aperture over which the mouth is placed, and the "*mihut,*" which is fashioned somewhat after the form of a trumpet or trombone. Each performer has but one pipe, and consequently like the Russian, is master of but one note; there is no particular air or time attended to, each giving out his breathing very much as he chooses; but the wild music falls soft upon the ear like the harmonious sound of the Panden pipe blown over by the breeze.

124. The Abyssinian fiddle, the "*musuncho,*" is of rude form and fashion; an empty gourd or a hollow square of wood being carved with a piece of parchment as a sounding board, and a bit of rough stick inserted in one corner to serve as the neck; there is but one string, and as the performer is not a Paganini, the inharmonious sounds proceed from the instrument as if the unhappy spirit of music was confined in the interior, and uttered harsh screams and moans as the bow proceeded to inflict fresh tortures upon her agonized sinews. Some continue to perpetrate a very faint resemblance to tune; but all consider themselves at perfect liberty to scrape away in the most persevering and soul-sorrowing fashion, and unlucky indeed is the site of residence if stationed near the proprietor of a *musuncho.*

125. The harp, called "*buggana,*" is a most strange fabrication of wood, leather, and sheep's entrails, and presents an appearance as if an old leathern portmanteau had been taken by children as a foundation, and built up with the rudest materials to represent the lyre in the days of Tubal; nor do the notes belie the first appearance of the instrument, or bestow any credit whatever on the fashion. It has five strings, and is used only as an accompaniment to the voice, a simple monotonous cadence of the individual notes being the only music produced.

126. The large drum, called "*kubbers,*" and the small one "*naggarect,*" are not thumped so continually as might be expected, they are exclusively reserved for military expeditions, or for doing honor to the happy return of friends and relations from successful journeys, and it is indeed lucky for foreigners, that the nation with their present set of crude instruments is not infected with a musical mania. The silence of

night is seldom disturbed by the discordant sound of their barbarous attempts.

127. A portion of the vocal music is of a more pleasing description, and some of the airs which the women croon over their work are even soft and plaintive, There is, however, no great change of note in the strain, which has generally reference to the particular operation in which they are employed.

128. The recitative of the war songs is pitched in a high key, and chaunted by a single individual at the top of his pipe; and the thundéring chorus, which consists of a few words in deep base, is at intervals poured from every throat in the party, with great effect. The return of a successful army is indeed a most striking pageant; the glitter of the silver ornaments, the flashing of gay cloths and housings, and the shrill chaunt of the fight, closely followed by the pealing bass of triumph echoing from ten thousand merciless throats, forming altogether the very embodying of savage exultation.

129. Their church music is most execrable; although seven long years are passed in its acquisition, and the constant practice of many hours during the day ought to make them somewhat more perfect. Howling and screaming, however, are the most appropriate terms to be employed for this ceremony, and the hoarse cracked voice of the priest, increasing in fury as he progresses in his task, is in true keeping with the jingle of the "*itsnassil,*"* the Abyssinian timbrel, which in its startling effect, can be compared to nought but the rattle of the poker upon the tongs.

130. From four in the morning until nine of the Sabbath, this clatter and ranting is continued for the *honor* of their religion in all the churches of the kingdom, besides a full muster of their croaking choristers on all their numerous holidays and festivals; and the band of stout priests who nightly mount guard to preserve His Majesty by their song from the influence of evil demons, have certainly chosen a cunning path to prevent the advent of, at least, all those spirits who are gifted with any musical taste.

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* This is the "sistrum" which is thought to be included under the Hebrew term "Tzitzelem," and is composed of a frame of sonorous metal crossed by bars of the same; these bars move freely in the holes through which they are passed, and when the instrument is shaken, the reverted ends striking upon the frame produce the clattering sound.

131. The attending dance of the priesthood is any thing but a relief to the picture; the most uncouth attitudes and the most ungraceful positions are selected, whilst the beard and the crutch and the aged face are but in ill keeping with the mountebank jumps and capers performed upon the occasion. During the merry-makings in the palace and in the houses of the chiefs, the dance is also not distinguished by any less ludicrous effects, the votary seemingly enacting the part of a gander justly infuriated at the discordant sound of the music, shaking his wings and hissing in contempt of the fiddler's art, whilst he shuffles about in a crouching position, and makes sundry furious rushings and startings to possess himself of the obnoxious instrument.

132. The language of savages is generally highly metaphorical, and they are not satisfied unless action be embodied to the eye by color and character and form brought more vividly to the mind by the assistance of allegory, but this nation is equally unsuccessful in the personification of the spiritual, as in the abstract language of Theology.

The king and his chief singer form the only exceptions, the court language being sparingly sprinkled with a few flowery speeches, and the singer sometimes breaking out into crude allegorical sentences. "Why should the Father of song be restrained from dancing before the fathers of gold," he exclaimed when capering before the embassy on the steps of the palace, and the saying was responded to with shouts from the populace; but the topics of discourse are always scanty among an uneducated race, and after the daily salutations are performed, nothing can be more rapidly stupid than the succeeding conversations of the native of Shoa.

133. Few but the priests and *deptras* can read or write, and many among those learned scribes are more indebted to the memory of their early youth, than to the page held in their hands for the forthcoming rant.

134. The ancient Ethiopic, which is also called Gees, remained the language of the empire only until the 14th century of our era, and in this idiom are written all the annals of her religion. It has now, however, fallen into disuse, and the people of Tigri alone retain one of its dialects. Amhara is generally spoken throughout the country.

135. The stores of literature being thus bound up in a dead letter, mistakes and false readings cannot be discovered in the low mumble of the officiating priest by the bystanders, who are alike ignorant of the text and the language; nor is the course of study of that extended or liberal nature to enlarge the mind of the neophyte. To know the Psalms of David by rote, together with the miracles of the Virgin Mary and Saint Tsela Huimandt, to elevate the voice into howling song, and to cut a caper into the air two feet above the surface of the earth, forming the envied accomplishments of the man of education.

136. Parchment is said to have been invented at Pergamos when the Egyptian monarch prohibited the exportation of papyrus. The Jews very early availed themselves of the Charta Pergamora to write their scriptures upon: the roll is still used in their synagogues, and was introduced into Abyssinia on the Hebrew emigration, where it still continues the only material in the country; but all the books extant are composed of many small leaves fastened one upon the other, enclosed between wooden boards, and carefully deposited in leathern sacks; many are embellished with glaring colored daubs, and all are looked upon with the eye of superstitious credulity.

137. The epistolary correspondence* is exceedingly laconic; the letters are folded up into small rolls, varying in size from one inch to four, and always enclosed in a coating of wax; there is neither signature nor superscription. The king possesses a signet seal, which is however seldom applied, as the names of all parties are introduced into the body of the note.

138. The pen is the reed, *kulum* of the East, without the slit, and the inkstand is the sharp end of a cow's horn, which is stuck in the ground as the scribe squats to his work; the ink is a foreign importation from the Somauli coast, and remains an intense black for ages, and the writer when he wishes to replenish his horn, inserts a few particles from his pocket, and adding a little liquid, produces a consistency similar in thickness to that used in printing.

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* May this letter of queen Bezabesh come to my friend the English Ambassador.

Are you well? Are you quite well? Are you perfectly well?

That the soap may not end speedily, you will send it in large quantities, saith Bezabesh.

139. But the Abyssinian scribes do not hold the pen of a ready writer, and the dilatory management of their awkward instrument is attended with gestures and attitudes most distressingly ludicrous, clutching the tiny style like a hot apple in the paws of a hungry ape. It is carried with the most convulsive twitches, and seemingly by some supernatural force to the mouth of the writer, where the end is seized between the teeth and masticated, in a sort of mental phrenzy. During the whole period of this strange operation, the thin strip of dirty vellum is held at arms-length and viewed askance from every side, with looks of utter horror and dismay, and when at last the stick descends to dig its furrow upon the parchment, no terrified school-boy with the birch of the master hanging over his devoted head, ever took such pains in pointing the most elaborate pot-hook, as does the Abyssinian scribe in daubing his strange characters upon the scroll.

140. Like the Chinaman, each individual letter must be looked at from every point of view, before progressing to the next; every word must be read again and again by the delighted artist, and the greasy skin must be many times turned upside down by the grinning penman proud of his talents, to observe the happy effect of his handy-work.

141. During the intervals of approval, the destructive bites continue fast and fierce, to the utter demolition of the pencil; and long before the termination of the first sentence, European patience is apt to become utterly exhausted at the scene of awkward, foolish stupidity, and gross waste of valuable time. Seventeen years have been employed in transcribing a single manuscript, and a common epistle of five lines is the utmost extent of one entire day's exertion.

142. The following list gives the names of all the books at present in existence in Abyssinia. Tradition, however, records the titles of other works, which were deposited for safety in the islands in the Lake Zoo-ai, on the great invasion of Gragno, and which are said to exist with many other precious treasures of Ethiopia even unto this day.

1. All parts of the Old Testament, excepting the Pentateuch and the Books of the Maccabees.
2. The four Gospels with readings.
3. Chrysostom. Biography and Exposition of the Epistle to the Hebrews.
4. A dogmatical work of Cyril.

5. Genset. A book used in funeral solemnities, and ascribed to Athanasius.
6. Tethonegest. The code of Laws, said to have fallen from heaven.
7. Aclements.
8. Retuattaunanot. The Orthodox Faith.
9. Siena Aibud. History of the Jews in connection with the History of other ancient nations.
10. Mazopu. Extract from Ancient Philosophy.
11. Henosh. The Prophecies of Henosh.
12. Gadela Nudual. History of St. Michael.
13. Gadela zida Heimanot. Life of the Tecla Heimanot, the Saint.
14. Gadola Siena Markoo. Life of another Saint.
15. Gadela Gintra Maafao Kedus St. Zl.
16. Gadela Lalsbala. Life of a former emperor of Ethiopia.
17. Masgaba Haimanot. A dogmatical work.
18. Synodos. Canons of the Church, attributed to the Apostles.
19. Antiacos. Colloquy between Athanasius and a Nobleman called Antiakos.
20. Mazafa Mister. The principles of several Heretics of old.
21. Mazafa Dora.
22. Mazafa Timkal. Used in Christening.
23. Mazafa Actil. Used in blessing a Marriage.
24. Mazafa Keder. Used for instructing Renegades.
25. Gusbra Haimanot. Read during Passion Week.
26. Bartos.
27. Dionasios.
28. Teena Tetrak (Amharic.) Explanation of the Creation.
29. Tamera a Miriam. Miracles of the Holy Virgin.
30. Magara Miriam, Words of ditto ditto.
31. Godela Hawarjat. Lives of the Apostles,
32. Ardeet. Words said to have been spoken by Christ before his Ascension.
33. Kedasie. Liturgy of the Abyssinian Church.
34. Wuddassie Miriam. Praise to the Holy Virgin.
35. Arganon.
36. Gadela Samactal. Lives of the Martyrs.
37. Abushukur. Abyssinian Almanac.

38. Gadela Adam. History of Adam.
39. Kidan.
40. Egsiabher Neges.
41. Anda Negest. Book for Prognostication: forbidden in Shoa.
42. Sadela Medhanalim. Life of the Saviour.
43. Amida Mister (Amharic.) The Principal Doctrines of the Christian Church.
44. Temhest. Extracts.
45. Kufalik. Words spoken to Moses on Mount Sinai.
46. Mazafa Gragore (Amharic.) History of the invader Gragno.
47. Serata Breta. Christian Institutions of the Christian Church.
48. Mewaset. Hymns on Mournful occasions.
49. Zema Degna. Hymns sung during Fast times.
50. Degna, Hymns sung on other occasions.
51. Lifafa Zedik. A Book of absurd Contests, much esteemed, and buried along with the Corpse.
52. Ekabari. Book of Prayers.
53. Zelota Musa. Prayers of Moses against the influence of Evil Spirits.
54. Melka Michael. Prayers to St. Michael.
55. Melka Ijesus. Prayers to Jesus and the Holy Virgin.
56. Gadela Araga. Life of an Abyssinian Saint.
57. Gadela Kyros. Ditto ditto
58. Gadela Johani. Ditto ditto
59. Kotat of the 318 Fathers.
60. Maala Saalat. Prayers and Hymns for different hours of the day.
61. Wuddassie Amlac. Praise of God.
62. Mazafa Tornal. A letter which Christ is said to have written.
63. Surguamie Fidel (Amharic.)
64. Melka Gabriel. Prayers to St. Gabriel.
65. Swaso. Abyssinian Dictionary.
66. Germana. Prayers to frighten Evil Spirits.
67. Fans Manfasawi.
68. Dersana Sanbat. Life of a Saint.
69. Tekarie Ijesus. Christ's prophecy of the consummation of the World.

70. Mazafa Shekeneat.
71. Tecla Zeon.
72. Harmanot ab. Doctrines of the Abyssinian Church.
73. Gadela Antonino. Life of the Monk Antony.
74. Zelota Musadud. Prayers against Evil Spirits.
75 Dezsona Gabriel. History of St. Gabriel.
76. Gadela Georgio. Life of St. George.
77. Selota Monakosat. Prayers of the Monks.
78. Felekosus. Book of Monking.
79. Marishak. Book of Monkery.
80. Aragawi Manfasawi. Ditto ditto.
81. Dersana Mahajawi. Life of the Life-giver.
82. Gadela Saunel.
83. Siena Aban.
84. Gebin Negest.
85. Geea Moie.
86. Epiphanius.
87. Aximarius.
88. Buni.
89. Synkesar.
90. Mazafa Berhanet.
91. Lowros.
92. Deduskalea.
93. Tamera Ijesus,
94. Ankoritos.
95. Mazafa Ishai.
96. Teliksiny.
97. Mistera Samai.
98. Georgis Waloea Amid.
99. Dersana Miriam.
100. Lik Evangel.
101. Taretch.
102. Gadela Ijob.
103. Thomas Koprianos.
104. Gadela Keduson.
105. Gadela Arsemaror.
106. Raia Miriam.

107. Gadela Abeb.
108. Gadela Makod Walale.
109. Gadela Guebru Christas.
110. Abicta Natrat.

143. Such is the accumulated literature of ages, and in the mass there are only four written in the language at present spoken and understood. His Majesty possesses a large assortment of manuscripts seldom referred to, and indeed with the exception of the Holy Scriptures, the remnant is but a tissue of absurd Church controversy, and lying monkish legends.

144. Thirty days constitute a month, to which five days and the fourth part of a day are added to complete the year; this interpolation is called "*quagmin*," and is introduced after the month of September, the 9th day of which, according to our style, commences the Abyssinian year. The year is also divided into four quarters, each being named after the Gospel, which ought to be at that season reading in the churches. From September to November, Luke gives name to the period; from December to February, John; from March till May, Matthew; and during the remaining months, Mark. Events are commonly referred to as having occurred during the days of Matthew, &c., but they have lost eight years in their computations of time, and our present Christian era of 1842, has only reached to 1833 of Abyssinian reckoning.*

145. Superstitious to a degree, the Abyssinian will undertake no expedition or serious journey without, in the first instance, receiving the desired omen of approbation from on high, and retracing their steps on various pretences, they remain in their houses for days until the welcome sign be witnessed. The sight of a hare is very bad indeed; an antelope springing across the road, good; a fox barking on the left hand, destroys all hope of a happy result; but on the right hand, a prosperous issue may be expected; but of all the numerous birds of ill fame, is the "Goorasovula." (?) Certain death or destruction, or the most dire disaster are certain to follow his croak, and there is no inhabitant in the kingdom, who has not some story to confirm the bad character of this evil bird. The fool-hardy wight, who giveth no heed to the warning note

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* Giving the world an existence of 7334 years, they calculate that our Saviour was born in the year 5,500 after the Creation, and thus account for their deficiency.

being of a certainty either baulked in the object of his journey, robbed, maltreated, or murdered.

146. Savage man obtaining only through the medium of his own wishes and imagination a faint idea of the invisible and supreme Power, seeks for some tangible object of veneration and means of protection, and the Abyssinian, whose vague religious ideas afford him but small consolation in the hour of tribulation, and little reliance of security in the day of danger, reposes the utmost faith in the doctrine of charms, which present a substance stamped with a mystic and supernatural character, and capable of being attached to himself individually. The "*tulsim,*" which is a worked zone studded with tiny leathern pockets, containing sacred charms enclosed in double and treble cases, encircles the waist of every man, woman and child in the kingdom; the arms and neck are also hung in a perfect panoply of amulets against the influence of every disease, whether experienced or anticipated; the written talismans of holy monks, mixed with the seed and leaves of potent witch plants, gathered by the hand of the forest recluse, afford a feeling of security which is not to be extracted from the leaves of the Gospel; and no one ever thinks of mounting his mule, without being well stored with these paper preservatives against the spear of the robber, or the sharp knife of the Galla.

147. On the first arrival of the Embassy on the frontier, the simple natives on their knees implored the gift of the anxiously desired charm against the charge of the dreaded lion, and the king himself, by no means free from the prevailing superstition, had in his possession two talismans, which till lately he considered of high dread and import; they were inscribed on parchment in the French language, one containing a portion of the Lord's Prayer, and the other the words, "May God open the eyes of Sabela Selassie to his errors."

148. Their superstitions are childish as they are numerous. They believe in the evil eye, in the existence of evil spirits who roam about the earth and waters, and in every description of omen, and the ignorance of many is passing strange, considering St. Michael to be God Almighty; the Virgin Mary the creatoress of the world; and Sunday, to have been a saint of great sanctity, far superior to St. George or St. Michael, which has ensured for him one day in seven to be held holy to his name, whilst the others have their festivals only once during the month.

149. Eclipses of the sun or moon, as in other savage countries, afford an ample opportunity for the most abject superstition. They believe the orb to be dead, and that her demise prognosticates war, famine and pestilence. The whole town is in tumult and uproar, collecting together in the streets and churches, they cry aloud upon the Saviour of the world to take pity upon them, to screen them from the wrath of God, and to cover them with a veil of mercy for the sake of Mary, the mother of our Lord. The pagan Galla, who are present lifting up their voices, join in the petition, and from their not comprehending the Amhara tongue, render the most absurd construction on the prayer; the wailing continues during the whole period of obscuration, and when the orb again emerges, a universal shout of joy is raised, in the full belief that the prayers of the multitude have awakened her from the sleep of death. Any neglect on their part, of these accustomed exertions, is certain to be followed by some great public calamity, and the raining down of fire from heaven.

150. The "*beza,*" or sacrifice for the sick, is considered lawful and efficacious, and is frequently resorted to; the animal which is meant as the type of the sick man is driven round the bed of the invalid amidst much noise and singing, and afterwards slaughtered outside the threshold, and at other times, an egg is turned three times towards the head of the patient, and then broken besides the bed.

151. Whilst no religion can be more corrupt than the nominal Christianity of this unhappy nation, which is a mass of absurdities borrowed from the Jew, the Moslem and the Pagan, nothing can be more humiliating than the superstition which it encourages. A thread of cotton yarn is stretched by the hired sorcerer during the night completely round the house, the extremities are fastened together by means of a link of iron, well imbued in blood, and the walls are freely sprinkled and bedaubed with gore,the day dawns upon the incantation which is supposed to be the work of the devil himself; and of the assembled multitude, who consider that some heavy calamity, if not instant death, would follow the act, there is not one individual sufficiently bold to remove the spell, and thus release the inmates from its withering effects. On one occasion, when the inhabitants of Ankobar were thrown into the greatest consternation by the dread appearance of the bloody finger, the Reverend Mr. Kraff tore away the charm, to the astonishment of all, without any fatal consequence to himself; but that very night the defeated sorcerer planned an attack

to rob his premises, which was only defeated by the extra vigilance preserved in consequence of having exposed the impostor.

152. No Amhara will venture to destroy a serpent save on Saturday and Sunday, when the sight of one of these reptiles is regarded as a favourable omen. In common with the heathen Galla, the Christians of Shoa make annual votive sacrifices in June to "*Sar*," the evil spirit, continuing the practice notwithstanding its being interdicted by royal proclamation under the penalty of forfeiture of property. Three men and a woman, who understand how to deal with the evil one having assembled at the place appointed, perform the ceremony in a newly swept house. The sacrifice consists of a ginger coloured hen, a red she-goat or a male Adaiel goat with a white collar; the blood of the victim having been mixed with grease and butter, is secretly placed during the night in a narrow street, when all who step or tread thereon, are supposed to receive the maladies of the invalid, who in return is restored to perfect health. The king perceived traces of this Pagan ceremony in the streets of Motatiel during a visit to that village some years ago, and tracing it to a wealthy individual who had caused the rite to be performed in order to free himself of syphilis, the honor of true religion was forthwith vindicated by a speedy transfer to the royal coffers of all the property of the dabbler in unholy rites.

153. The drum of the water kelpie is heard by the credulous native in the echo of every roaring waterfall, and the wretch drowning in the overflowing torrent is dragged under the rushing wave as the highly coveted food of the malicious spirit of the deep. Divers plants and herbs possess the most baneful properties and qualities, and a bunch of the Fegain grass, if skilfully cast upon the person of an obnoxious enemy, produces dire disease, sickness and death.

154. Sorcerers and necromancers attaining the respectable age of 4 and 500 years, exist in numbers in this land, flitting through the air and riding upon the wings of the wind at pleasure, and unbidden and invisible guests, eating the best and drinking the choicest liquors on the festive board.

155. "*Thavanan*," the great sorcerer of modern days, is looked upon with universal dread, and his last public act is still fresh in the memory of the present generation. He had for a long time indulged his palate, and enjoyed his place unseen at the king's own table, but being at

length informed against by one of his malicious fraternity, he was by means of a strong spell exposed in the fact, and ordered to instant death. "Grant me but my life," he exclaimed, "and I will explain to your Majesty this grand master-stroke of my powerful art." The curiosity of the monarch was excited, and a large vessel of water which had been requested was set before the magician. Placing his hand in the liquid, he addressed the king: "Oh descendant of the race of Solomon, the wit of thy illustrious father is dull in comparison with the wisdom of the meanest disciples of Arobal, I defy thy myrmidons and thyself," and cleaving the air as he uttered these words, instantaneously disappeared from the gaze of the astounded and crest-fallen court.

156. *Arobal Mammoo,* the king of the Genis, is supposed to reside in the depths of the large lake in Mans, called *Moofat Wuha.* In the bosom of its placid water his palace is placed, constructed of the usual fairy materials; coloured cloths abound in every apartment, and his drums are heard pealing from the centre of the lake, when famine, war or pestilence is about to visit the land. Any one desirous of studying the black art after destroying his *mahtab,* (the badge of Christianity,) and treating the emblem of faith with certain irreverences, proceeds into the depths of the waters, is met by the genius, and kindly instructed in the arts of magic and necromancy; after a laspe of time he resumes his blue silk cord and is suffered for a time to exercise his supernatural power upon earth, but his knowledge gradually decays, it cannot be resumed, and the sorcerer again sinks into the uninteresting character of an Abyssinian Christian, without even the usual conclusion of having lost his soul, or being in the end carried away in the talons of the foul fiend.

157. It is fully believed, that one of *Arobal's* disciples succeeded by the power of his medicines in transferring all Asfa Wassun's concubines to his own harem, and having been seized and remonstrated with on the gross impropriety of his conduct, he behaved in the most insolent manner, and referred the proceeding entirely to the high assistance of his friend, the genius of the lake. In his extremity, he was deserted by the spirit, and the *crim. con.* being fully established, he was put to death by order of the king, and the misguided ladies brought back in durance vile to the palace; but his character for subtle medicines was fully established, as one of the concubines shortly afterwards de-

prived the monarch of his eye-sight by means of a powerful spell, which had been imparted by her learned paramour.

158. But the enchanted village of "Daska Stephanas," hid from mortal gaze, and enclosing upon earth all the pleasures of paradise, forms the never-failing topic of all wonder-loving souls; the poetic fancy of Abyssinia has been utterly exhausted in depicting this rare scene of delight.

159. "Its sleep-soothing groves with lawns between, are situated on the Nile, where released from the loose shackles of all marriages whatever, beautiful females are plentiful as they are common. Potent liquors flow on in never-ending streams, and the earth yields her spontaneous fruits without care or labour. But shrouded in the magic mist, these Elysian fields open their portals only to mortals of commanding form and handsome feature, on whom the glance of favor has been cast by the fair inmates of the enchanted garden; human endeavour is of no avail to unriddle the mystery, and the dread art of the sorcerer and his most powerful talismans, are alike unavailing to unloose the spell for the benefit of any of those unfortunates on whom nature has bestowed a tortuous figure, or an ill-starred visage."

160. The blacksmith is also endowed with supernatural powers by the credulous Abyssinians, and is supposed to be able to transform himself at pleasure into the likeness of a wolf or hyena; the cunning practice being in common use amongst the craft of secretly encasing the whelp of one of these animals in a metal collar, which being retained in after life, strengthens in the eyes of the uninitiated the fabulous stories in circulation.

161. The presence of any Christian emblem, badge, or portion of the Holy Scripture is supposed to neutralize the handicraft of the dreaded artist. The metal cannot be wielded in sight of the cross, and will by no means assume the required design, should any scrap of the Bible be worn on the person of the bye-stander. Whilst fumbling with their imperfect instruments to transform a bar of iron into the necessary repair of one of the galloper guns, the small draft of air which proceeded from the tiny bellows, proved insufficient to heat the metal, and the native artists' smelters declared aloud, that the phenomenon was consequent on the presence of some holy charm. Badges and emblems, charms and amulets were incontinently stripped off by all; the labour

was renewed without any better effect, and the smiths stood aghast at the enchanted bar which would not become heated.

162. The large forge bellows of the Embassy was produced, and a sufficient blast being obtained, the assembly were ordered to don all their paper preservatives and stand round the anvil, the sparks now flew under the brawny arm of the European, and the job was forthwith completed, to the utter dismay of the Abyssinian magicians, who came privately to request, that no further public performance of the sort might henceforth take place, as their name and glory would entirely depart from the land.

163. Sickness and misfortune are attributed to the effects of the evil eye of the Bondak. Long consultations are held to discover the person whose sinister look has imparted the calamity, and when the suspicions have gradually settled into conviction, the most implacable hatred is ever afterwards entertained towards the dreaded personage, and although concealed under the guise of indifference, which the savage can so successfully assume, yet the opportunity of revenge is never lost sight of, and the sweet morsel is obtained in some underhand dealing of after-life. Dedjmateh Harloo, the father of the Dedjmateh-ou-lie, added much to his notoriety by the extermination of all the Bondaks he could lay hands upon. Superstition exulted in a reeking hecatomb of human victims, and the love and veneration of his subjects knew no bounds on his last summary act of collecting together, and roasting to death 1300 of these miserable wretches, who were supposed to possess the influence of the evil eye.

164. The Abyssinian contrives to fill up his craving stomach, and in general possesses a sufficiency of covering to preserve him, after his fashion, from the inclemency of the weather. The climate is indifferently good, and the earth yields her treasures without much fatigue or bodily exertion, but the food is not of the best description, the style of life and habitation most uncomfortable, and all combine to engender the seeds of disease and death, and to reduce the limit of existence to less than three score years and ten.

165. Elephantiasis is known in its most loathsome forms. Ophthalmia seems to be common, and syphilis is met with in some shape or other on every second individual. Leprosy is rife among the community, and the mountainous nature of the country renders the atmosphere sufficiently damp and cold for the location of rheumatism and catarrh;

altogether the inhabitants are decidedly open to all the ills to which flesh is certain heir in the most favored part of the globe, and they do not possess the more civilized means of alleviation.

166. Medicine is yet in its infancy, and charms and amulets, and sacrifices are resorted to, in the hour of sickness. The potent purgative, *cosso,* is applied to on almost every occasion, and its debilitating effects no doubt lead to shorten life. Paddling about in the mud with naked feet, and exposing the bare head to the sun, the blast and the tempest without any reference even to comfort, cannot prove conducive to health, and residing in frail fragile tenements amidst dirt and vermin, and surrounded by filth and putrefaction, must have the most injurious effect upon the constitution. The low regard with which all females are entertained, debars the enjoyment of conjugal affection. The want of education denies the profitable and pleasant employment of leisure time. Coarse fare is the general lot; little amusement or holiday vary the dull monotony of life, and bullied by the Church, the king, and the nobles, a short existence is passed in this world in no very great happiness or comfort, and the spirit passes away without any very distinct idea of what is to happen in the next.

167. Compared with the other nations in Africa, Abyssinia certainly holds a high station, superior in arts and agriculture, in law, religion and social condition to all the other benighted swarthy children of the sun, and the portion of good which does exist, may be justly ascribed to the remains of the wreck of Christianity, which although stranded upon a rocky shore, and buffeted by the storms of ages, still continues to contain a few precious gems amidst the overwhelming mass of sand and sea spume.

168. But the misery, the filth, and the moral degradation in which she vegetates, sinks her far below the level of any European nation, and the parent land remains obscured in the fogs of her original barbarity, whilst the morning sun of intelligence has in the mean time lightened upon the social existence of her remote colony:* nay she has even

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* Customs rarely alter in a country so entirely isolated as Abyssinia, and where the influence of new ideas cannot lead to the perfection of the arts and sciences, and many of the present usages in the land would, in some measure prove what the Ethiopians affirmed in the time of Diodorus, that Egypt was originally one of her colonies; the very soil and earth being brought down from their plateaus by the flood of the Nile,

retrograded from her pristine state, and the great empire of Ethiopia has long since cracked and fallen to pieces. The shadow of a mighty name, the pagans have overrun her fairest provinces. The Christian chiefs of every district madly strive for superiority, and the great horrors of war are only averted by the imbecility of the national character. Still monks and priests and aged men are wantonly put to death. Houses and villages sacked and destroyed, and the stream of oppression rises hot and heavy from every quarter of this distracted country. The property, the liberty, and the reputation of the subject are entirely at the caprice of the ruler, domestic ties and affection are little known or understood; small comfort is enjoyed in the transactions of private life; the debasing effect of extended slavery holds firm footing upon the mind; superstition shrouds the land in her thick veil; and the day seems to be yet far distant, when she shall stretch out her hands to heaven, and be at peace with her Maker.

169. In arts, in industry, and in moral existence, Abyssinian Shoa remains indeed secluded in a dense cloud of darkness; her agriculture is the only redeeming feature, but the fertility of the soil is rather to be praised, than any great advances she has hitherto made in the science of husbandry.

170. Manufactures are restricted to the supply of the most simple wants: a coarse cotton cloth to cover nakedness, a skin of leather to serve as a bed, a mat basket to contain the most necessary food. The gold and silver ornaments are certainly made with some taste, but being solely for the benefit of one individual, cannot be thrown into the balance of the national account, and the little that is understood extraction of the metal from the earth evinces great imperfection of talent.

and there existing at that time a striking resemblance in many of the customs and laws of the two nations, each giving the title of Deity to their kings. The funerals in either country being performed with equal care and splendour; the writing in usage being the same in both countries; and the knowledge of the written character retained solely among those belonging to the priesthood. In both countries there are monasteries and religious colleges organized after a similar fashion, and those who are consecrated to the service of God, are supposed to practice the same rules of abstinence and sanctity; they are dressed alike, and have shaven heads, their kings wear the same description of robes and ornaments. The hair of the commoners is still dressed after the fashion depicted in the ancient Egyptian designs, and the use of sandals fabricated of leaves, which is recorded in ancient Egyptian story, is to this day extant in Abyssinia.

171. The difficulties and perils of the journey, and the unsettled state of the country, oblige to travel in caravans, and the slow tramp of the wearied mule, and the foot-sore slave, render commercial intercourse dilatory and of rare occurrence. Salt its still the great staple of importation, together with a few beads and course Arabian manufactures, and the return, which is made in grain, cloth and slaves. is certainly neither to the profit, nor to the increased enlightenment of the Abyssinian.

172. All the accommodations of life are simple and limited; the houses are mere stakes badly plastered with earth, and afford little shelter from the elements, while the internal arrangements are equally rude and scanty.

173. The intellectual features present a peculiar deficiency. Few can read the character, and still fewer understand the meaning of the manuscript. The educated priests for the most part learn like the parrot, by rote, and rant at the top of their lungs, passages of which they know not the sense. The utter ignorance of the laity is truly deplorable: few can spell out a line during an hour's severe exertion, and none can write three words together. Their books are all of a sacred nature, and being written in an unknown language, are looked upon in the light of charms, specially if well bound and filled with pictures; and although the kiss of debasing superstition be imprinted upon the colored daub, the intellectual vision remains unlit by the words of the text.

174. Poetry and painting are in their veriest infancy. Music has been ushered into existence a deformed monster; and architecture still remains unbegotten in the dark abyss of Abyssinian ignorance.

175. In religion they are debased, superstitious, and bigotted, believing the most absurd and ridiculous doctrines, and resting their only hope of salvation on fasts and pilgrimage, on confession and priestly absolution.

176. In private life their character is equally despicable, and they have strangely contrived to accumulate all the vices of civilized as well as of savage life, and have succeeded in retaining but few of the virtuous traits of either. Nay, their very existence is the vegetation of a noxious weed in the foul kennel; but the refinements of civilized society have not as yet supplied the beauties of original simplicity. The box of

Pandora has indeed been doubly locked after allowing all the scourges of mankind to escape with their full muster of attendants, and all the horrors of savage warfare, of merciless slavery, and of debasing despotism ride triumphant over the land.

177. Cowards, fanatics and liars; cruel, superstitious and profligate; proud of their deformities, and constant only in their inconstancy, they are bullies and beggars of the most transcendant character, whilst their dirty unclean habits render them a perfect nuisance to all with whom they come in contact; glorying in the most savage, revolting and barbarous practices, which are hardly credible, except to eye-witnesses, their life is at complete variance with all the ordinary customs of other people. Brutalizing, like wild beasts on raw bloody flesh, when others have adopted the spit and the kitchen fire; wearing no protection on the head and their feet, when all others having long since proclaimed the necessity of the covering; exposing their naked persons as a sign of respect, contrary to every received law of shame, and existing in all the filth of unwashed persons and dark unswept hovels, they have indeed but little cause for the inordinate self-pride in which they hyperbolically style their petty location the finest of countries, and its unclean inhabitants, the only true Christians in the world.

History of the Abyssinian Church.—English Missions.

The departure of the Jesuit Patriarch was followed by a fierce persecution of all who were in any degree tainted by the abhorred faith of the Romans, and the last legacy of the western priest proved a fatal gift to the possessor. Suspected individuals wherever found were immediately put to death, and in accordance with the earnest entreaties of the population, and with the long established usage of Ethiopia, a new Abuna was appointed from Egypt, to preside over the ancient religion, now firmly re-established throughout the land.

But the failure of the ambitious designs of the Church of Rome had in Europe been entirely ascribed to the arrogance and cruelty of the emissaries employed, which had created so deep and lasting a hatred among the mass of the inhabitants; and the milder order of French

Capuchins was accordingly put in requisition to bring about the desired re-union with the heretic church of Abyssinia. Six chosen men of the order, fully provided with the firmans of protection from the court of Constantinople, were first entrusted with the enterprize during the middle of the seventeenth century, of these four succeeded in penetrating into the country, but only to suffer the martyrdom of St. Stephen, and the remaining two, terrified at the fate of their unfortunate brethren, returned without hope of success to their monastery in France.

The zeal of the order nevertheless made one further effort in the cause, and again three doomed friars landed at Suakem, whence they despatched a letter to congratulate the Emperor on their safe arrival in his vicinity. Instead, however, of the anticipated presents, and means of conveyance to the court, an order for their execution was received by the governor of the town, and the stuffed heads of the fathers were forwarded for inspection, that the fair skin and the tonsure of the foreign priest might be fully recognized, and the promised reward be claimed by the inhospitable Pacha of the Coast.

Poucet's interesting descriptions still remain to commemorate a further quest which in 1700 was undertaken, in company with a member of the Society of Jesus; but the partner of his journey died in Nubia, and many doubts have been reasonably entertained regarding the truth of the physician's narrative. Matters are painted with more than travellers' license, and the imagination freely drawn upon for facts that never existed.. The close of his career also served to throw a deep shade of disbelief over the minds of even the most credulous; for after receiving from the French monarch magnificent presents for the Emperor and Court of Abyssinia, he crossed the Red Sea, and penetrating into Persia, died at Ispahan, with the character of being a perfect impostor.*

A last attempt was made a few years subsequently by Pope Clement XI, and four German Franciscans were despatched in the cause of Rome to the country of the intractable Abyssinian. The poverty of these missionaries, and the humility with which they refused all temporal wealth, touched the heart of the reigning emperor, and although he forbade them to preach in public, he pledged himself to protect their lives and promote the cause of their mission. " Your work is difficult," said the monarch, " it demands time, and you must be prudent, and not arouse the prejudices of the people; God did not create the world in one moment, but in six days."

Finding secret admission into the houses of many individuals, the Jesuits were beginning to gain ground, when the monks and clergy, who had suffered the most severely during the former struggle, raised an outcry, that the Europeans were the enemies of the Mother of God, and had blasphemed her holy name. The tumult became universal, and a powerful conspiracy was arranged to poison the friars, and dethrone the emperor. David, a young prince of the imperial family was called to the throne, and the unfortunate missionaries having been dragged from their place of concealment, were condemned to forfeit their lives.

On being offered a free pardon if they would abjure the Roman faith, the last martyrs to the cause indignantly rejected the proposal, and the young monarch struck with their devotion and endurance under severe and perilous trial, commanded that they might be banished from the land; but the monks preferred stoning them to death, and the event accordingly took place in the year 1718.

So ended the ardent endeavours to substitute one superstition in the room of another. Time, and life, and means, had been wantonly expended, that the triumphant chariot of Rome might grind over the neck of the Abyssinian; but the costly sacrifice was impotent, and the ambition of binding a far country in the fetters of spiritual slavery sunk deservedly to nought.

Another century rolled on before the Christians of the West bestirred themselves in the cause of enlightenment. The Apostolic Church had fallen from her high place, and it was reserved for the members of another faith to carry the glad tidings of salvation to the benighted people of Ethiopia.

The great traveller, Bruce, had now for ever broken the mysterious seal of ignorance which had hitherto bound the land as with an iron zone, and his Abyssinian friend and companion, the learned Abraham, after ten years of patient industry, had completed his pious labours. A translation of the Holy Scriptures was faithfully rendered into the popular language of the country, and the precious document was purchased in 1818, by the Bible Society of Great Britain.

The Reverend Messrs. Gobat and Kugler first penetrated into northern Abyssinia, and established their residence at Adowa, and the Reverend Messrs. Kraff and Isenberg, followed in the same path.

The words of the true Gospel were listened to by the natives with every attention, and amidst a scene of universal corruption, the pure lives of the preachers were beheld with amazement. But intrigue and foreign influence produced a revulsion in the mind of Aubie, the tyrant prince of Tigré, and the order for departure to the coast was enforced by the governor of the town, who was anxious to possess himself of property, that could not be removed from his avaricious grasp. Their names, nevertheless, remain in the land, and to this day the English missionaries are spoken of with the greatest reverence, as possessing every quality that was good, mild, and just.

Ardent zeal in the cause of Christianity again induced Messrs. Isenberg and Kraff to brave the dangers of an unexplored route through the fiery desert of the inhospitable Adaiel, and to endure the foul annoyance of a savage existence. The kingdom of Shoa now forms the theatre of their praiseworthy exertions. Dogmatical treatises have been ably penned in the vernacular language of the country; a school in the capital extends to the rising generation the means of improvement, and the example of a holy life will no doubt produce a happy effect.

But the uphill task of the missionary is indeed hard, and the wonder is, that any thing has been accomplished, and not that the harvest is scanty. Disliked as a stranger of envied accomplishments, despised as an alien to the land, and hated by the ignorant and bigotted priesthood, the words of truth fall unheeded from lips the most eloquent, and the most zealous endeavours prove of little avail. Perfectly satisfied with his own creed, the Abyssinian finds it easier to kiss the holy book than to peruse its contents, and to trust to the priestly absolution, instead of moulding his conduct according to the doctrines of pure faith. The rude artizan is esteemed of higher importance than the erudite Missionary, and blinded by the grossest superstition, engulphed in a sink of bestiality, and wedded to the manners, the customs, and the doctrines which are diametrically opposed to the evidences of the Gospel, it is not until the arts of civilized society shall have been introduced, and the neck of the self-sufficient Abyssinian bent under the superiority of the stranger, that the barrier can be finally overcome, and one step be gained towards the restoration of the unhappy country of the true word of God.

The constitution of the church, the second great power of Shoa, is simple, and the sway over the public mind seems to be the effect rather of individual power than of a public body. Few lay men attend a chapel unless on the festival of their own saint; but all present offerings according to their means, and whilst few peruse the Holy Scriptures, every great man entertains in his house a priest in the capacity of father Confessor. In every clerical conclave, the king possesses the supreme voice of authority, and as from him proceeds, in a principal measure, not only the more temporal comforts of bread, beef and hydromel, but also punishments for real or fancied delinquency; the despotic monarch may here be justly regarded as the head of his own Church.

The Abuna or Archbishop is, however, the real spiritual chief of Ethiopia; consecrated by the Patriarch of Alexandria, and possessing with rich revenues, the intelligence of other lands: he is universally feared and respected throughout the empire, and all religious differences and dissensions must be carried for his final decision. Princes and rulers pay implicit deference to his high behest, and seated on the ground before his episcopal throne, receive, with the utmost respect, his every wish and advice.

Feuds and quarrels betwixt state and state are satisfactorily arranged in his presence, and war, tyranny, and violence are controlled by his commanding voice of mildness and benevolence. But the extent of his diocese is great, and many local difficulties oppose the pastoral visit to the extremities of his See.

The wild Galla, the bigot Moslem, and the pestilential morass, intervene in every direction, and the kingdom of Shoa, peculiarly insulated by these obstacles to access, has for ages been deprived of the advantages accruing from the residence of an Archbishop.

In the hands of the Abuna are vested the exclusive power of consecration. Bishops, priests, and deacons can from him alone receive holy office and function; and before assuming the clerical crook and cloak, the inhabitants of the most remote provinces must invariably repair to his court to undergo the requisite examination, and receive the indispensible blessing and authority. He only it is who grants absolution for heavy offences against either God or man, and the ark of a church, whether newly constructed or polluted by the unhallowed touch of a Mahomedan, must be purified by his hands, with the holy ***merom***, before being entitled to that high adoration which it thenceforward receives.

The second place in spiritual dignity is filled by the *Cheggrie*, the head of the monks, seated on the throne of Tekla Haimanot, one of the first founders of the orders of seclusion. He engrosses the management of all the various monastic establishments throughout the empire, and in his hand remains the charge of existing literature and education. Deeply versed in the subtleties of theology, his opinion is held of the highest import in the never-ceasing disputes upon the uninteresting subjects of false faith, which occupy the mind of the Abyssinian divine; but his authority extends only to the simple admittance into the monkish order, and to granting absolution for the minor offences of evil thought and prescribed fasts neglected.

The offices of the *Comus*, or Bishop, who ranks next above the common priest are few and simple. Without diocese or even authority over the inferior members of the Church, his peculiar function is to bless and purify the sacred ark, should it accidentally receive the impure touch of the deacon or layman, to repeat the prayer of admission, and sign the cross on the skull cap of the candidate for the monastic seclusion, and to afford absolution for trivial offences against the conscience.

Ignorant, bigotted, and licentious, the priesthood of Shoa are restrained under little rule or authority. The beauty of morality influences not their conduct, and punishable only by the king, or by their own brethren vice, excepting of the most flagrant nature, and resounding through the voice of an indignant people, is screened by the fellow-feeling of the sympathizing judges. Their number and cause might effect high power in the realm, but indolence and dissolute habits counteract the influence; and contented with the outward mark of respect from a besotted multitude, and enjoying a fair proportion of the good things of this world, they give little heed for the care of souls, either here or hereafter.

But in order to obtain the desired and enviable position of eating the bread of comparative idleness, a sacrifice is indispensible. The priest is restricted to the possession of one single wife, and on the demise or infidelity, no second marriage is authorized.

A small portion of labour must moreover be endured, the psalms of David must be carefully conned, and the mysteries of Abyssinian song and dance be fully penetrated before the sacred office can be obtained. The lessons of early youth are, however, soon forgotten, and the constant repetition of the same words, removes the necessity of retaining the character. Few in after-years can read, and still fewer respect the vow of celibacy; and the morning hours of the Sabbath and of the holidays, employed in dancing and shouting within the walls of the church, entitle the performer to all immunities, and comforts pertaining to holy orders.

Divine service within the precincts of the sacred edifice is limited to the delivery of a passage of the Gospel rendered into ancient Greek, a language long since dead throughout the land. Psalms are bawled at the extremity of stout lungs amidst capering and clashing of timbrels; the miracles of Saint Mary and of St. George are chaunted, and the worship is invariably concluded by an equitable division of the consecrated bread, which remains from the morning communion.

The rite of baptism is performed in an adjacent building, and the solemnization of matrimony is rarely resorted to in the land; but the death and the funeral feast are studiously attended, with much advantage to the temporal interests of the church. The choicest food is unsparingly dealt out to all, and the bereaved widow is glad to leave the management of her affairs to the assiduous father confessor. The dying man bestows a portion of his estate in this world for the bright hopes which absolution extends in that which is to come, and the holy sacrament is even administered after the soul has quitted the tenement of clay, in order that the superstition of grateful relatives may grant a rich reward for the blessing of the priest, and his undeniable assurance of exemption from the pains of punishment hereafter.

Deacons are usually chosen from among children of tender age, and on reaching maturity the life of the adult is not distinguished by the spotless purity of his duties in the office. The functions of these juvenile noviciates are light, it is theirs to be present during Divine service in the capacity of servitors and assistants, to complete the requisite number at the celebration of the holy communion, and to guard and preserve the sacred ark in case of accident by fire or water.

This mysterious casket is an object of all-engrossing adoration, and in its presence consists the only sanctity of the church. All prostrate themselves to the ground, as the box, which resembles the Jewish ark, is carried in procession through the street, and when replaced in its case in the holy of holies the air is rent by the attendant priests with shouts in the temple of the eternal God.

Fasts, penances, and excommunications form the chief props of the clerical power; but the repentant sinner can always purchase a substitute to undergo the two former, and the law of the Church is readily averted by a timely offering. Spiritual offences are indeed of rare occurrence, for murder and sacrilege alone give umbrage to the easy conscience of the Abyssinian, and all other crimes written in the book of Christian commandment have been well nigh effaced from the surface of the tables. The nation is by no means religiously inclined, and the strict observance of weekly fasts, with suitable largesses to the priest and mendicant, are quite sufficient to ensure the requisite absolution for every sin committed in the flesh.

The churches are in general very miserable edifices of wattle and mud plaster, distinguished from the surrounding hovels by a thin coating of whitewash, which is dashed over the outside, to point with the finger of pride to the peculiar privilege of the two great powers in the land. Circular in form, the wretched thatch is surmounted by grasses glittering with brass and ostrich eggs, whilst the interior decorations are guided by the same depraved and heathenish taste.

Eight feet in breadth, the first compartment stretches after the fashion of a corridor, entirely around the building, and being strewed throughout with green rushes, forms the scene of morning worship. To the right of the entrance door is the seat of honor for priests and erudite scribes, and beyond this court, save on certain occasions, the bare foot of the unlearned layman cannot pass.

The uncleansed walls are festooned with ancient and dingy cobwebs, no unappropriate drapery to the wretched daubs which serve to cover the mud, and are designed to represent St. George and his green dragon, the patron saint of the church, the blessed virgin, and a truly incongruous assemblage of cherubims and fallen angels, with the evil one himself enveloped in hell's flames.

A dark inner compartment forms a last separation from the holy of holies which contains the sacred ark, and is completely shrouded from sight by the screens of glaring cotton cloth. Timbrels and crutches depend in picturesque confusion from the bare rafters of the roof; no ceiling protects the head from the descent of the lizard and spider; and the *tout ensemble* of the Abyssinian church presents the strongest mixture of slattern finery and of squalid filth.

Certain revenues and estates are set apart for the support of each clerical establishment, and to ensure the proper distribution, an *Alaha*, or chief, is elected by the monarch from either class of society. Whilst a successful foray is followed by liberal donations from the throne, the safe return from a journey is acknowledged by an offering on the part of the private individual, and the shade of the venerable juniper trees which adorn the church yard, is ever crowded with groups of sleek hooded priests, who bask in the enjoyment of idle indulgence.

Loss of office is the great punishment inflicted by the spiritual court, which is composed of the assembled members of the individual church, and degradation is followed by the expulsion of the offending brother from the community. But the imperial hall of justice is no unfrequently graced with the presence of the refractory priest, and fetters in the dungeon, or banishment from the realm, maintain a wholesome fear of the royal power of investigation in matters ecclesiastical.

Monks swarm throughout the land, and the huts of the monasteries are always pleasantly situated in the depths of some shady forest around the church dedicated to the patron saint. Fields and revenues still remain in the possession of these orders, notwithstanding that the duties for which they were originally assigned, are now seldom performed. Education was in former days to be obtained alone from the inmate of the monastic abode; and a life of scanty food, austerity, and severe fastings was embraced only by the more enthusiastic. But the skin cloak and the dirty head-dress now envelop the listless monk, who satisfied with a dreamy and indolent existence, basks during the day on the grassy banks of the sparkling rivulet, and prefers a bare sufficiency of coarse fare from the hand of royal charity, to the sweeter morsel earned by the sweat of his brow.

The monk is admitted to the order of his choice by any officiating priest. A prayer is repeated, the skull cap blessed with the sign of the cross, and the ceremony is complete. But a more imposing rite attends the oath of celibacy before the Abuna. Priests assemble in numbers and fires are lighted around the person of the candidate. His loins are bound about with the leathern girdle of St. John, and the prayer and the requiem for the dead rise pealing from the circle. The Glaswa, a narrow strip of black cloth adorned with colored crosses, is then placed on the shaven crown and shrouded from view by the enveloping shawl, and the Archbishop, clad in his robes of state, having repeated the concluding prayer and blessing, signs with his own hand the emblem of faith over the various parts of the body.

But Abyssinia possesses no idea of the more salutary doctrines of Christianity. Polluted faith is here reflected in the mirror of her depraved manners; and long, severe fastings constitute the essence of her degenerate religion. The idol worship of saints has made rapid progress in the land, and the ignorance of her clergy is only to be equalled by the impurity of the lay classes. Their belief in Christianity, if that term can be applied, is strange, childish and inconsistent; and bigoted to the faith of their ancestors, they abhor and despise all who refuse to sign this, their absurd confession.

" That God created all religions in the world and that each is perfect of its kind except that of the Shankala, but that separate places are prepared for each creed in Heaven.

" That the Alexandrian faith is the only true belief.

" That faith together with Baptism, are sufficient for justification, but that God demands alms and fasting, as amends for sin committed prior to the performance of the baptismal rite.

" That unchristened children are not saved.

" That the Baptism of water is the true regeneration.

" That invocation ought to be made to the saints, because sinning mortals are unworthy to appear in the presence of God, and because if the saints be well loved, they will listen to all prayer.

" That all sins are forgiven from the moment that the kiss of the pilgrim is imprinted on the stones of Jerusalem, and that kissing the hand of a priest, purifies the body from all sin.

" That sins must be confessed to the priest, saints invoked, and full faith reposed in charms and amulets, more especially if written in an unknown tongue.

" That prayers for the dead are necessary, and absolution indispensable; but that the souls of the departed do not immediately enter upon a state of happiness, the period being in exact accordance with the alms and prayers that are expended upon earth."

All ideas regarding salvation are indeed vague and indefinite, and vain, foolish doctrines have taken entire possession of the shallow thoughts of the Abyssinian. Born in falsehood and deceit, cradled in bloodshed, and nursed in the arms of idleness and debauchery, the national character is truly painted in the confession of one of her degraded Sons: "Whensoever we behold the pleasing ware, we desire to steal it, and we are never in the company of a man whom we dislike, that we do not wish to kill him on the spot."

Throughout the land the basest superstition reigns triumphant. The kiss of adoration is imprinted on the external pillar of the Church, and men proceed on their way in perfect security of the protection of the patron saint. The unwilling female is driven to the Communion Table only as a test to suspected infidelity. The preservation of a fast, and absolution accorded by a licentious mortal, form the first grand principles of the religion of Shoa, and it would indeed prove a far easier task to sweep from off the face of the land, the present meretricious fabric, and to raise up a new temple in its stead, than to attempt the Herculean labour of cleansing, as it now stands, the impurities of this augean stable.

(Signed) D. C. GRAHAM, *Captain,*
Principal Assistant to the Embassy.

Rites and Practices of the Abyssinian Church, which appear to have been adopted from the Jews.

A lengthened detail of all the absurd confusion of doctrines which prevails in the church of Shoa, would prove neither pleasant nor profitable to the reader, and may moreover be perused in the learned dissertations of the Jesuits; but those rites and practices which the Abyssinians appear to have adopted from the Jews, are well worthy of remark, and we here insert them as a sequel to fill up the blank in the foregoing sketch of the Church History.

It is a matter of high importance to separate the manners and customs which a nation has borrowed, from those that she has produced during the advance of time within her own pale; and from an adequate knowledge of her self-activity, some idea may be formed of the station to which Ethiopia may be admitted within the ranks of civilization; and of the expectations that may reasonably be entertained in how far her efforts could be rendered subservient towards the improvement of the moral and political state of benighted Africa.

Surrounded by many hostile tribes, and secluded from enlightened intercourse since the capture of the Upper Nubia by the Turks, and the possession of the Red Sea by their numerous fleets, Abyssinia has retained her customs with little alteration since the sixteenth century, although that slight modification may be observed, which is not uncommon in the general history of mankind. During the fresh cruelty of the successful invader, national rites and practices are maintained with more than wonted stedfastness; but when the first violent assault of enmity has yielded to a more quiet intercourse, a mutual interchange is admitted between the contending parties, and thus the Jew, the Moslem, and the Pagan have each in their turn contributed to the general stock of Ethiopia.

Many circumstances, however, have continued to render the Abyssinian nation peculiarly susceptible of Jewish ideas and influence; and the abilities of her learned historians have in vain been racked to devise the most becoming legend, by which to account for the introduction into the empire of such a multiplicity of Hebrews.

In accordance with endeavours of other nations to derive their ancestry from demi-gods and heroes, the kings of the country boast a direct descent from the house of Solomon, and flatter themselves in the name of the wisest man of antiquity.

The high sounding title of king of the Israelites is added to that of Emperor of Abyssinia, and the motto of the national standard floats on the breeze—" The Lion of the tribe of Judah hath prevailed."

" The Queen of Ethiopia" says the tradition, " whose name was Alaqueda, had heard from the Merchant Tamerin, of the wisdom and the glory of the son of Sirach, and resolving to visit him in his own country, she proceeded to the land of Israel, with all the rich presents that her empire could afford.

"After a season the royal body returned, and her son Menelech, the result of her visit to the greatest potentate of the age, was born, and in due time transmitted to his august sire. The young prince was duly instructed in all the mysteries of Jewish law and science, and being anointed king, under the name of David, he was returned to his own land of Ethiopia, escorted by a large suit of the nobles of Israel, and a band of her most learned elders, under the direction of Ascarias, the son of Tradok, the High Priest.

"The gates of the temple of Jerusalem were left unguarded, and the doors miraculously opened, in order that the holy ark and the tables of the Law might without difficulty be stolen and carried away. The journey was prosperously performed, and the Queen Mother, on resigning the reins of authority to her son, caused a solemn obligation to be sworn by all, that henceforward no female should hold sway in the land, and that none but the issue of David should sit upon the throne of Ethiopia."

Although this tradition may in itself be considered inconsistent and improbable, the firm belief in the origin thus traced, will in a great measure account for the general inclination and consent to receive Jewish rites and practices, as they were in process of time presented.

The fable of Queen Maqueda was in all probability the invention of fugitive Jews, who after the destruction of Jerusalem by the Emperor Titus, emigrated to Ethiopia by way of the Red Sea, who disseminated the tradition with the design of obtaining the desired permission to settle in the country, and whose descendants, under the name of Falashas, are still extant among the mountains of Simien and Lasta.

The real queen of Sheba or Saba, known to the Arabs under the title of Belkis or Nicanta, reigned over a portion of Arabia Felix. Want of geographical information and inquiry perpetuated the error of antiquity, which extended Ethiopia to Arabia; and the Sabacans and Homerites, who inhabited the Southern portion of the land, are frequently confounded with the swarthier sons of Africa.

But the queen of the South, who came to hear the wisdom of Solomon, brought along with her the produce of her own country; and camels and spices, gold and precious stones, pertains not unto Ethiopia. The first Christian Missionary found the inhabitants of Abyssinia idolaters and worshippers of the great serpent Arwe; whereas, according to tradition, the Jewish faith had been for ages established firmly in the empire.

No Hebrew literature remains to support the legend. The Holy Scriptures were not even translated into the language of the country. No connexion was in after-times maintained with the land of fellow-faith, neither was any assistance afforded in the day of her distress, when Israel suffered under the despoiling hand of the Abyssinian and the Babylonian, and bent her oppressed neck to the yoke of Egypt and of Rome.

The family of Menelech Ibnel Hakim are stated, in the Kebra Negest, the glory of the kings, to have possessed the throne in uninterrupted felicity until the year 960, when the massacre of the issue of Solomon was perpetrated by the woman Essat, and one solitary prince of the blood royal alone escaped to take refuge in the distant and loyal province of Shoa. During the succeeding four hundred years, it is asserted by the learned historians, that the usurping rulers of the fairer provinces of the empire were Jews, who exerted their utmost endeavours towards the propagation of their religious creed, and that when the legitimate dynasty was again restored under Ican Amlac, the Hebrew prejudices had taken too deep a root, to be easily eradicated from the mind.

But the names and histories of many of these usurpers still remain to confute the tale; and although in furtherance of political objects, privileges might have been granted to the numerous Jews residing in the country, it does not appear that the party ever gained sufficient preponderance to place one of their own faith upon the throne, and thus the origin of the existing rites must take a humbler flight to be in union with the truth.

Ignorance is indeed too glaring a feature in the character of the nation, and remains a monument of the first conspicuous fruit of her delight in the confusion of truth and falsehood; superstition required the consistence of fable, and learned doctors of the law became robbers of the temple. The conscience was not galled by the fabrication of ten thousand miracles, which stain the pages of her Church History, and the honor of Ethiopia triumphed in an origin, which was ascribed to base illegitimacy and intrigue.

The ancestors of those Jews who to the present day exist in Abyssinia, arrived long before the nation had embraced the Christian religion, and in their attempts to obtain moral influence over their Pagan hosts, were far from being inactive in their adopted home. The early Christian church, that of Egypt especially, having embraced many Hebrew customs, was now introduced into a country, where similar doctrines and practices were already in use, and hence it arose, that the population so readily became converts.

In process of time the Jews increased in numbers, and a consequent augmentation of influence was obtained over the fickle mind of the Abyssinian. Christianity was wanting from the beginning, and their claim to the appellation of "*Habeshi,*" a mixed and mixing people, was never more aptly exemplified than in the strange medley of religion which resulted in the confusion. A mixture from different nations—as stigmatized by the original term—they have garbled the faith of all their ancestors, and there is assuredly no Christian community in the whole world, which has jumbled together truth and falsehood with such utter inconsistency as the vain church of Abyssinia.

With the destruction of the race of Solomon, the Jewish party obtained the preponderance, because their assistance was indispensable to the usurper. Again, on the restoration of the legitimate dynasty, they were hunted among the mountains as a race accursed, and the feeling reigned paramount to sweep the wanderers from the face of the land. But the custom of ages had impressed the Hebrew practices too deeply to be removed. They were in fact regarded in the light of orthodox Christian doctrines, and as might have been expected from a wicked, bigotted, and superstitious people, the severest persecutions were enforced against the members of another creed, without the Abyssinians observing in how far they were themselves tainted with those very principles, which in others they considered so justifiable to oppress.

The same restrictions which prohibited the Jews from partaking of the flesh of certain animals pronounced unclean by the Mosaic law, still heavily binds the stubborn neck of the Ethiopian. The act which is deemed disgraceful in the eyes of men is in itself firmly believed to be a moral transgression, and is visited, as was the case in the Mosaic institution, by the stern reprimand of the priest. The penance of severe fasting, or of uneasy repose upon the bare ground is enforced by the father confessor, to efface the taint of the interdicted animal; and prayers must be repeated, and holy water pentifully be springled over the defiled person of that sinning individual, who shall have dared to touch the meat of the hare, or the swine, or the aquatic fowl.

"The children of Israel did not eat of the sinew which shrank, which is upon the hollow of the thigh." This nerve is in the Amharic language termed "*Shoolada,*" and it is prohibited and held unlawful in Shoa, more especially to the members of the royal blood considered as highly unclean; it ranks with the carrion carcase, and the universal belief prevails, that the touch of the unholy morsel would infallibly be followed by the loss of the offending teeth, as a direct proof of the just indignation of Heaven.

The Abyssinian cannot be brought to admit, that every creature of the universe being alike the work of the Almighty, must necessarily be clean, and that those which are not noxious to health can therefore be used for man's food, if accepted with thanksgiving towards the Creator. The liberal spirit of Christianity is indeed wonderfully clouded in darkness, and the stranger who professes its tenets, but withholds his subscription to the creed of narrow and fanatic ideas, is regarded as worse than the surrounding heathen, and condemned to eternal perdition.

The Jewish sabbath is moreover strictly observed throughout the kingdom. The ox and the ass are at rest; agricultural pursuits are suspended; household avocations must be laid aside; and the spirit of idleness reigns throughout the day.

Abolished by the orders of the great Council of Laodicea, the oriental churches were, after the observance of centuries, freed from this burden, and men gladly availed themselves of the ecclesiastical license to work on the Saturday. Here, however, the ancient usage agreed too well with the laziness of the people, systematically trained to indolence and sloth; and when a few years ago, one daring spirit presumed, in advance of the age, to burst the fetters of superstition, His Majesty the king of Shoa, stimulated by the advice of besotted monks, delegated his wardens throughout the land, and issued a proclamation, that whosoever disturbed the original dreary stillness of the Jewish sabbath, should forfeit his property to the imperial treasury, and his person to the State dungeon.

Ludoff, the celebrated Strabo of Ethiopia, most accurately remarks, that there is no nation upon earth which fasts so strictly as the Abyssinians, and that they would rather commit a great crime than touch food on the day of abstinence. They not only boast, with the Pharisee, "I fast twice a week," but pride themselves also upon their mortification of the flesh during half the entire year; whilst the haughty and self-sufficient monk vaunts his meagre diet as the only means of expiation from sin and evil desire.

The Abyssinians, in common with other Christian communities who rigidly observe the fasts of Wednesday and Friday, advance as an argument, that the Jews seized our Saviour on the first of those days, and on the second carried into execution their design of crucifixion; but as this account differs from the evidence of the Gospel, which shews that the arrest took place upon Thursday, the observance is most probably an imitation of the weekly fasts in existence among the Jews.

The fast of the forty days before Easter is preserved with much greater rigour than any other in Abyssinia, and the reckless individual, who shall neglect the great *toma hodada*, cannot possess one sentiment of true religion in his heart. To the abstinence of this season especially are attached peculiar virtues, which completely nullify the effect of every sin that may be committed throughout the residue of the year.

According to the Jewish practice, all culinary utensils must thoroughly be cleansed and polished, to the end, that no particle of meat or prohibited food may remain to pollute the pious intention. Journeys and travels are strictly interdicted, and from Thursday until Easter moon, no morsel should enter the lip, and the parched throat ought to remain without moisture.

During the fast of the Holy Virgin, children of tender years are not even exempted from the penance of sixteen days; and during the many and weary weeks of abstinence which roll slowly throughout the entire year, the Abyssinian priest would grant no dispensation to the famished mortal, were he to receive an immediate mandate from heaven.

Sabela Selassie arose some years ago, a mighty zealot in the cause, and perceiving that the custom was beginning to decline, proclaimed, through the royal heralds, pains and penalties sufficiently severe to ensure the future strict observance of the fast. The commands of the defender of the Faith were however in one instance transgressed by a soldier during a military expedition; but his excuse of fatigue under a heavy load of the king's camp equipage was admitted; and although on similar occasions a certain license is extended, still the monarch preserves a strict watch over the maintenance of church discipline, and delights to perceive the stranger imitating the hypocrisy of his own example.

All the absurd ideas of the Jewish Rabbins, regarding the dead, have been received and embraced by the fathers of Abyssinia. They maintain that the soul of the departed does not immediately enter into the kingdom of joy, but is conducted to an earthly paradise situated in an invisible spot between the heaven and the earth, where it remains until the resurrection in a state of happiness or torment, according to the alms and prayers bestowed by surviving relatives and friends. Niches in the same spot are also occupied by the saints, and the inconsistency of their faith fully appears in the belief, that the intercession of the Almighty is absolutely necessary of these very saints, who themselves require mortal mediation to be absolved from their spiritual imperfections, and to be suffered to rest in peace until the coming of Christ.

But the self-interest of the avaricious priest is wrapped up in the preservation of this doctrine. The clergy riot in the price of death-bed confession, and a corner of the church yard is sternly denied to all who die without the due performance of the rite, or whose relations refuse the fee and the funeral feast. The payment of half a crown, however, wafts the soul of a poor man to a place of rest; and the *tescar* or banquet for the dead, places him in a degree of happiness, according to the costliness of the entertainment. The price of eternal bliss is necessarily higher to the rich, but German crowns procure the attendance of venal priests, who absolve and pray continually day and night, and the reeking burial feast is frequently devoured in commemoration of the event. Royalty is taxed at a still more costly rate, and the anniversaries of the deaths of the six kings of Shoa are held with great ceremony in the capital. Once during every twelve months, before the commencement of a splendid feast, their souls are fully absolved from all sin, and the munificence of their illustrious descendant is still further displayed in the long line of beeves, which afterwards winds its way to the threshold of every church in Ankober.

The Talmud asserts, that those who die piously, remain in a state of active knowledge of all the occurrences of this world. Philo, the learned Jew of Alexandria, informs us, that the souls of the Patriarchs pray incessantly for the Jewish nation, and the erudite Rabbins believed that angels are the governors of all sublunary things, and that a man in every country has a guardian angel for protection and direction. The Abyssinians carry this belief even further. They confidently anticipate the intercession of saints and angels in all spiritual and secular concerns. They invoke and adore them in even a higher degree than the Creator; all their churches are dedicated to one in particular, and the holy ark is regarded as the visible representative of the respective patron. Without this *talot* the church is not Christian, and heretics alone doubt of its wonderful virtues and inherent power. Prayers and vows are offered to the box, and the kiss of adoration is held sufficient to bring down the desirable blessing. The ark of St. Michael accompanies all military expeditions to ensure success against the Galla, and that of Tekla Haimanot stands the palladium of the North, to preserve the empire from the attacks of the Mahomedan prince of Argobba.

Like the Pagans of ancient and modern times, who placed between the most High God and themselves a species of inferior deity, the Abyssinians observe this species of idolatary, although the names of their tutelar spirits have been changed. St. Michael and the Holy Virgin are here venerated as in no other country of the world; the former as the martial leader of all the choirs of angels, the latter as chieftainess of all the saints, and queen of heaven and of earth. Both are considered as the great intercessors for mankind, and the prayer arises to their name, and the honor is ascribed to their memory, which belongeth only to the one Eternal.

The detrimental influence of this superstition is fully exemplified in the conduct of the nation. The mediator is ever employed when individual courage fails in impudent assurance or insatiable beggary. Time is uselessly wasted in importunity, which all believe must in the end prove successful, and the practice of invocation and intercession thus exerts the most baneful tendency even upon the daily dealing of life.

Like the Jews of old, the Abyssinians weep and lament on all occasions of death, and the shriek ascends to the sky, as if the soul could be again recalled from the world of spirits. The hired mourner of the Israelites raised the piteous wail. Here the friends and relatives of the departed assemble for the same purpose, and the absence of any from the scene is ascribed to want of love and affection. As with the Jews, the most inferior garments are employed as the weeds of woe, and the skin, torn and scarified from the temples, proclaims the plunge into the last extremity of grief.

In later days, the extravagance of mourning has been somewhat moderated through the agency of a priest of the church of St. George, who stood boldly forward to arrest a practice equally at variance with the sacred books of the country, and with the spirit of the New Testament. Excommunication thundered her wrath upon all who should thenceforth indulge in the luxury of woe, and the people trembled under the ban of the Church. The death of a great governor soon confirmed the restriction. Loved and esteemed by all classes, the prohibition was severely felt. The complaint of lamentation was referred to the throne, and as the deceased was a man of rank and a royal favorite with all, the clergy were commanded to grant absolution in this one instance. But Zeddoo, the stout-hearted priest arose and declared, that he had no respect for persons, and the words of truth must be defended to the death. The silence of the monarch enforced the ecclesiastical fiat, and to this day the drum is mute at the funeral wake, and customary praise of the deceased is heard no more in the public resorts of the capital.

On the annual day of atonement, the Jews were obliged to confess their sins before a priest. In like manner, the Abyssinians are commanded from time to time to perform the ceremony during the great fast of *Hodada* more particularly, and on Good Friday, the day of the Jewish expiation; and as the slave in token of his freedom and dismissal received the blow from the Roman proctor, so the penitent on absolution, receives the stroke over the shoulders from the branch of the *woira* tree, as a sign of his deliverance from sin and Satan.

Murder and sacrilege ought to be immediately revealed to the officiating priest, and a particular confession of all crimes is enjoined once before death. The father-confessor is bound to the strictest secrecy, and it is believed, that on this point a dreadful oath is taken before ordination, when the mysteries of religion are explained by the *Abuna*, and especially those which have reference to the preparation of bread for the Holy Supper. In a small house styled Bethlehem, which rises immediately behind every church, the mysterious ceremony is performed. The deacon can alone bake the cake, and the most vigilant guard is invariably preserved against the approach or intrusion of females, or other improper visitors during the hours of solemn preparation.

The Jewish temple consisted of three distinct divisions; the fore Court, the Holy, and the Holy of Holies. To the first, laymen were admitted, to the second only the priest, and to the third the High-priest alone. All entrance was denied to the Pagan, a custom which is still enforced in Abyssinia, and her churches are in a like manner divided into three parts.

"Keunic Maalt" is the first enclosure to which all laymen have access, and wherein the priests and *defteras* perform Divine service by singing, dancing, and drumming. "Mukdas" is the second, a corner of which is set apart for laymen during the administration of the Holy Supper, whilst a cloth screens the mysteries of the interior. Here also hang arranged around the walls, the bones of many deceased worthies which have been carefully gathered from the newly opened sepulchre, and are deposited by the hand of the priest in cotton bags. By the nearest relative the first opportunity is embraced of transporting these mouldering emblems of mortality to the sacred resting place of Debra Lebanos, where the living and the dead are alike blessed with a rich treasure of righteousness, since the remains of Tekla Haiman, the patron saint of Abyssinia, still throw over the scene of his miracles upon earth, a bright halo of holiness.

"To Kuddist," the Holy of Holies, none but priests are admitted. Behind its veil, the Sacrament is consecrated, and the tremendous mysteries of the ark are shrouded from the eyes of the uninitiated. Prayers, vows, and offerings are daily made to this idol sitting in the centre of the Abyssinian church, and the handiwork of some vain ecclesiastic is held up to the admiring multitude as the true ark of holiness, which secreted in a cave during the inroad of the conquering Graigne, has been discovered by a miraculous dream from heaven. Even unto this day the spoils of the temple of Jerusalem are supposed to remain a blessing to the land, and old and young, rich and poor, bow the knees as to the Omnipotent Creator, before a round wooden box which contains nought save the name of the patron saint of the Church.

But among the ignorant mass, the mystery is carefully preserved. The priest who dared open the lip to his countrymen regarding the contents of the casket, would suffer the heavy penalties due to sacrilege; and although the gold of the foreigner has penetrated the secret of its interior, the dense fog of superstition will long obscure the disgraceful idolatry from the confined understanding of the bigotted son of Shoa.

Like the Jews, the Abyssinians, although objecting to sculpture, ornament their churches with paintings, and kiss and pay the miserable daub every religious respect. The vow is offered as of old to the temple of Jerusalem, and oil and frankincense, shields and spears, cloths and money, are offered according to the worldly substance of the pious and superstitious donor.

The sweet singer of Israel danced and jumped before the Lord, and a vile caricature imitation remains the chief point of Abyssinian worship. Capering and beating the ground with their feet, whilst stretching their crutches towards each other with frantic gesticulations, the performers rather resemble lunatics than holy priests, and the clash of the timbrel, the sound of the drum, and the howling of harsh voices, complete a most strange form of devotion.

Like the Jews, the Abyssinians invariably commence the service with the Trisagion, and the morning lesson is performed with the same careless and irreverent demeanor for which the Hebrews were latterly blamed. The lessons are taken partly from the Scriptures, and partly from the miracles of the Holy Virgin, and of Tekla Haimanot, the life of St. George, and other foolish and fabulous works; but all are in the ancient Ethiopian language, which to the congregation is a dead letter; and the sole edification of a visit to the church is comprised in the kiss that is imprinted on the portal.

Pride, hypocrisy, and contempt of other nations are strangely at variance with the absurd imitations of customs and manners, which the Abyssinians have adopted from all. The Jews also hated the Heathen bitterly, styling them "dogs," and rejected of God: whilst notwithstanding their contempt and pride of holiness, they willingly received many of their superstitious practices. The Abyssinian will not eat with the Galla or the Mahomedan, lest he should thereby participate in the delusion of his creed; and the church and the church-yard are equally closed against all who commit this deadly sin. But the order of separation was applicable so long only as the knowledge of the one true God was restricted to a single nation; and the prominent principle of Christianity that the light of the true faith should shine before all men, and be no longer concealed under a bushel, is here neither understood nor regarded.

The Abyssinians have also fully adopted the same spirit of merciless destruction, which impelled the Israelites to destroy their enemies from the face of the earth; considering themselves the lineal descendants of those heroes of ancient history, who were arrayed against the enemies of the Lord, they are actuated by the same motives and feelings which led the hand of Judah to the massacre. The foe is a Pagan who does not fast, nor kiss the church, nor wear a watch. All feelings of humanity are thrown to the winds, and a high reward in Heaven awaits the king and the blood-thirsty soldier for the burning of the hamlet, the capture of the property, and the murder of the accursed Heathen; self-interest rarely interferes in the tragedy of blood, and the captive is seldom secure even for the sake of the forthcoming ransom, or to pass the residue of miserable existence, a drudge in the household of the spoiler. The words of absolution from the mouth of the royal priest usher in the ruthless slaughter, and the name of the most high God is wantonly employed to consecrate the ensuing scenes of savage barbarity.

Abyssinia in her present state, belongs altogether to the ancient world. The pure principles of Christianity exist not in the land, and there remains not one solitary hope, that in her degraded condition she can tend, in any way to lift the curtain of moral darkness which hangs over the interior of the African continent; nor, redolent of evil principles and practice, is it to be desired, that she should be permitted to exert any important influence over the surrounding tribes.

The instruction gained from her teaching would prove small indeed, and the advance would be but trifling, from the state of heathenish superstition in which all are plunged alike.

The bigotry of ages is confirmed by the self-pride and the excessive ignorance of the present race; and on the rising, or on the unborn generation, rests the sole hope for the moral resurrection of the people.

But years must necessarily elapse before the folly and the falsehood of the nation can be successfully combated, ere the errors of her impure creed can be plucked out by the root, and the pure light of Christianity be introduced even by the most zealous and ardent messenger of the true Gospel.

(Signed) D. C. Graham, *Captain,*
Principal Assistant to the Embassy.

The Abyssinian Church.

Christianity is the national religion over the more elevated portions of Abyssinia, but the wild Galla has overrun her fairest provinces, and located himself in her most pleasant places. The bigotted Moslem crowds thick upon the skirts of her distracted empire, and the tenets she professes, are base, foolish, and degrading, engrafted on the superstitions of the Jew, the Mahomedan and the Pagan; promulgated by men, rude, ignorant and uninstructed, and received by a people emerging into the first stage of civilization. The light of religion must have been feeble even in the beginning, but as it was imparted, so it still remains. Sects and parties have arisen, and province has been banded against province in all the fiery wrath of the zealot; but lost in the maze of subtle controversy, these internal wars have raged for generations without disturbing the original doctrine, and the same errors of the Church prevail to this day throughout the land, as when first propounded in the beginning of the fourth century.

But the nation has not alone been called upon to sustain internal commotion, together with the fierce assaults of the heathen and of the fanatic followers of the false prophet. The measure of her oppression was not filled until the bitter cup had been drained, and deeply drained, of the converting zeal of European priesthood, until the usual horrors attendant upon religious war had been painfully undergone, and the requisite sacrifice of the life-stream of her children had been unsparingly poured out, when nearest and dearest relatives rallied under opposite standards, and when the same cry of destruction rung from either host—the glory of the true faith.

The glowing zeal of the Jesuit has seldom been displayed in more glaring colors, or in more decided defeat, than in the attempts so perseveringly made by that dread society to draw within the meshes of her encircling net, the remote church of Ethiopia. And although the means employed are to be justly condemned, still that ardour must be the theme of the high praise of all, which impelled old men and young to dare the difficulties and dangers of a rude uncivilized land, with exposure to the prejudices of a people, as bigotted as themselves in the cause of their religion.

But the wily system of establishing rival orders and monasteries, of mortification, of snapping asunder domestic ties, and of collecting together bands of discontented enthusiasts, well served the interests of the Catholic faith; and there were always to be found servants obedient to bear instructions to the farthest corners of the earth; men who relinquished few comforts or enjoyments on quitting their austere cells, who were prepared at all hazards and in all manners to carry into execution the will of their superiors, and who gloried in the prospect either of erecting an eternal fabric in honor of their faith and their own peculiar order, or of obtaining the equally bright crown of martyrdom.

But the custom of ages had struck too deep into the heart of the Abyssinian.

The power of the officiating clergy was paramount in the land. All the passions and the prejudices of the multitude were too firmly enlisted in the cause of ancient belief; and degraded as was the Christianity of the country, its forms and tenets were not more absurd and not less pertinaciously supported, than those innovatious of the Roman faith, which were so fiercely, though so ineffectually attempted.

The soft wily speech and the thunder of excommunication were alike disregarded. Treachery and force were both tried, and found equally unavailing. Blood flowed for a season like the swollen torrent, and the sound of wailing was heard from the palace to the peasant's hut; but the storm expended itself and finally passed away, and after the struggle of a century, the discomfited monks relinquished their attempts upon the church of the monophyzite, without leaving behind one solitary convert to their faith, and bearing along with them the loud maledictions of the much-injured nation upon the head of the intruding and officious European.

Abyssinia has not, however, always displayed that firmness of purpose, and that stoutness of heart to do battle for her existing creed. Bowing her neck in olden time to the yoke of Judaism, she now in many localities basely truckles, as convenient opportunity offers, to the tenets of the Islam faith.

The date of her embracing a portion of the Jewish creed is lost in the obscurity of ages. Some of her sons, who love even the notoriety of doubtful fame, glorying in an origin from Menelek, the son of Solomon and the Queen of Sheba, relate the most ridiculous exploits of these their venerated ancestors, who crowned a long course of iniquity by plundering the temple of Jerusalem, and carrying off the spoil and the holy books into Ethiopia; whilst others trace the legend of emigration to the period of the destruction of Jerusalem by the Romans. But whatever be the true date of their arrival, it is certain that the Hebrews have exercised a much greater influence upon the affairs of this country than in any other since the day of their dispersion; and although the taint of their religion was abjured by the nation on the Promethean touch of the true Gospel, the children of Israel, moulding a portion of their worship on the formula of the Christian faith, and esteemed as sorcerers and cunning artists in the land, found a safe asylum among the mountains, and exist to the present day here, as elsewhere, a separate and peculiar nation,

In the year 330, after the birth of our Saviour, Meropius, a merchant of Tyre, during a commercial voyage to India, landed on the coast of Ethiopia, where he was murdered by the barbarians, and his two sons, Fumentius and Edesius, both devout men, falling into the hands of the savage inhabitants, were made prisoners, and carried as slaves before the Emperor. The abilities, the information, and the peaceable demeanor of the brothers, soon gained not only their release, but high office in the court, and living in the full confidence of the monarch until his decease, and subsequently under the protection of the Queen mother, the good will of the entire nation quickly succeeded. The work of conversion was commenced, and proceeded with wonderful rapidity and success; a thriving branch was shortly added to the great Eastern Church.

Bearing the happy tidings, Frumentius appeared in Alexandria, and was received with open arms by the Patriarch Athanasius. Loaded with honors and consecrated the first Bishop of Ethiopia, a relation was thus happily commenced with Egypt, which has remained firm and friendly to the present day; and throughout fifteen centuries has bestowed upon a captive priest the high office of Patriarch Abuna of the Ethiopian church.

On his return to the country of his hopes, Frumentius found that the spark of life had spread rapidly throughout the gloomy darkness of the land. Baptism was instituted, Deacons and Presbyters appointed, churches erected, and a firm foundation laid, whereon to establish the Christian religion in Abyssinia. Frumentius was deservedly honored with a favored niche in the annals of her Church History, under the title of Salama, which formed the subject of high praise to all the sacred poets of Ethiopia.

> " Hail him with the voice of
> Joy, sing praise to Salama,
> The doors of pity and of mercy
> And of pleasant grace ; Salute
> Those blessed hands, bearing the
> Pure torch of the Gospel.
> For the splendour of Christ's Church
> Has enlightened our darkness."

During the succeeding century, priests and apostles, men of wonderful sanctity, flocked into the empire from all parts of the East, and miracles the most stupendous are related in the legends of those days. Mountains were removed, and the storms of the angry ocean stilled by the mere application of the staff. The adder and the basilisk glided harmlessly under foot ; and rivers stayed their roaring torrent, that the sandal of the holy man should remain unstained by the flood. Aragaine raised the dead ; the fingers of Likands flamed like tapers of fire ; Samuel rode upon his lion, and thus the kingdom of Arwe, the old serpent of Ethiopia, was utterly overthrown, destroyed, and annihilated.

The Abyssinians now rose to the scale of subtle casuists and disputants. Abstruse doctrines were propounded, and speculative theories largely indulged in, and the sun of existence set upon the generation ere the knotty points had been satisfactorily determined of how long Adam remained in Paradise before his Fall ? And whether in his present state he hold dominion over the angels ?

In the year 481, the celebrated council of Chalcedom, lighted up the torch of misunderstanding regarding the two natures of Christ. The Eastern church split and separated in mortal feud, and the Saracen pounced upon Egypt, rent and wasted by discord and distraction. The Abyssinians denouncing the Council as a meeting of fools, concurred in the opinion of the Alexandrian Patriarch.

The faith of the Monophyzite was declared to be the one only true and orthodox, and the banished Dioscorus received all the honors of a martyr.

> " The Kings of the earth divided the unity of God and man.
> Sing praises to the martyr, who laughed their religion to scorn.
> He was treated with indignity, they plucked out his flowing beard ;
> Yea, and tore the teeth from his venerable face. But in heaven a halo of honor
> shall encircle Dioscorus."

The successor of St. Mark, however, could barely retain his own existence in Egypt during the succeeding oppressions and exactions of the Moslem; and Ethiopia, his remote charge, now nearly isolated from the remainder of the world, remained for the next ten centuries a sealed book to European history, preserving her independence from all foreign yoke, and guarding in safety the flame of that faith which she had inherited from her fathers.

The reign of the Ascetics succeeded to that of disputation, and men lacerated their bodies, and lived in holes and caves of the earth like wild beasts. Tekla Haimanot and Eustathios were the great founders of monkery in the land. An angel announced the birth of one, and the other floated over the sea, borne in safety amidst the folds of his leathern garment. Miracles still continued to be occasionally performed. Sanctity was further enhanced by mortification of the flesh, and austerity of life was highly praised and followed by the admiring mob.

The original discipline of the anchorite was severe in the extreme. It was to be continually girt round the loins with heavy chains, and to remain for days immersed in the cold mountain stream, to recline upon the bare earth, and to subsist alone upon a scanty vegetable diet.

Monasteries were at length founded, and fields and revenues set apart for the convenience of their inmates; and although a visiting superior was appointed to check corruption and punish innovation or transgression, the asperities of the monastic life gradually softened down. The *cheggue* preferred the comforts of a settled abode to wearisome tours and visitations; further immunities were granted to all loving a life of ease and spiritual license, and the commonwealth deplored the loss of a great portion of her subjects, who assisted her neither in taxes, nor in military service.

Ethiopia meanwhile extended her wide empire on every side, and her religion was imposed upon the conquered territories. From the great river Gochoh to the frontiers of Nubia, the crutch and the cross pervaded the land. Churches were erected on every convenient spot, and the blue badge of nominal Christianity encircled the necks of an ignorant multitude. The usual wars and rebellion arose, and schisms and sects fill up the archives of ten centuries, with all the uninteresting precision of more civilized countries. But still the Church flourished; the Patriarch was regularly received from Alexandria, a long list of ninety-five

Abunas flows quietly through the dull pages of Abyssinian record, from the time of Frumentius the First until the days of the venerable Simeon, who whilst gallantly defending the faith of his fathers, was barbarously murdered by the European partizans of the Italian Jesuit. It was not until the commencement of the sixteenth century, that any further mention was made of the Abyssinian Church, which during the darkness of the middle ages had fallen into complete oblivion; but rumours about that period were whispered abroad of a Christian monarch and a Christian nation established in the centre of Africa, and the happy news was first brought to the court of Portugal, that a Christian Church still existed, which had for ages successfully resisted, among the lofty mountains of Abyssinia, the fierce attacks of the sanguinary Saracen.

In the year 1499, Pedro Cavilham succeeded in reaching Shoa, where he was received with that favor which novelty usually secures; and although the stranger was prevented by the ancient laws of the kingdom from leaving the land, the quest had been successfully performed; the first link re-established of a chain, which had been broken for ages, and shortly afterwards the glories of Prester John and his Christian court were fully disclosed to abate the intense anxiety that reigned in the heart of every inhabitant of the West.

In due time, an Abyssinian ambassador made his appearance in Portugal; unbounded delight was experienced by king Emanuel and his court, and every honor was lavished upon Matthew, the merchant of Shoa. All believed that the Abyssinians were devout Catholics, and that a vast empire, estimated at four times its actual extent, was about to fall under the dominion of the Roman Church. A mission on a great scale was fitted out, the journey was safely accomplished, and excited fancy rioted for a time in the description of palaces and fountains which never existed, and pomp, riches, and regal power utterly unknown in the land.

Missions continued from either court during the succeeding forty years. An alliance was formed. Men learned in the arts and sciences were despatched to settle in Abyssinia. Zaga Zaba arrived in Lisbon, invested with full powers to satisfy the interests of both countries, temporal as well as spiritual. But the difference of faith was now for the first time understood. The bitter enmity of the Roman creed stood prominently to view, and the envoy, after studying the details of the

Catholic doctrine, and refusing to subscribe a similar contract on behalf of his Church, was unscrupulously put to a violent death in a Portuguese prison.

The first flattering ideas regarding the religion of the country being thus found erroneous, the delusion respecting the extent and power of the mighty empire was next to fall to the ground. The Galla were now streaming in hordes from the interior, and Graigne, the Mahomedan invader, carrying fire and sword with his army throughout the country. The dying Coptish Patriarch of Abyssinia was prevailed upon to nominate as his successor John Bermudez, a resident Portuguese, and the Romish priest, hurried by the king, proceeded to seek immediate military assistance from the courts of Rome and Lisbon.

Schemes of ambition flitted over the minds of the first conquerors of India, and an alliance with Ethiopia seemed highly desirable, as a handle for further acquisition in the East. But dilatory measures delayed the arrival of the Portuguese fleet until the sueing monarch had been gathered to his fathers, and Christopher, the son of the famous Vasco de Gama anchored in the harbour of Massowah, at a time when the new emperor Claudius was sorely pressed to sustain himself upon the throne of his ancestors. The opportunity was not neglected by the Archbishop to reduce the heretic church to the fold of the Roman see; and a series of attempts were commenced, equally to be deplored, from the mischief which they created, and the unworthy means that were employed during the struggle.

The signal service rendered by the Portuguese troops during the ensuing wars, the total route of the Galla and Moslem, with the slaughter of their invading leader in the battle, placed Bermudez in a position to demand high terms from the re-instated monarch. The conversion of the emperor to the Roman Catholic faith, and the possession of one-third of the kingdom were imperiously proposed, and scornfully rejected. Excommunication was threatened by the proud prelate of the West, and utterly disregarded by king Claudius, who retorted, that the Pope himself was a heretic. Open hostilities broke out, and although the superior discipline of the Europeans for a time gave them the advantage, they were at length separated by a wily stratagem, and hurried to different quarters of the kingdom, and Bermudez being then seized, was conveyed in honorable exile to the rugged mountains of Efat.

Although much blood and considerable treasure had been thus fruitlessly expended, the conversion of Ethiopia was far from being forgotten in Europe, and the spark of hope was further kept alive by an Abyssinian priest, who asserted on his arrival in Rome, that the failure of Bermudez had entirely arisen from his own absurd and brutal conduct, and that the utmost deference would be paid to men of sense and capacity. Ignatius Loyola volunteered to repair in person to re-unite Ethiopia and the Roman Catholic church, but his talents being required for more important objects, the Pope refused the desired permission to the great founder of the Society of Jesus, and thirteen Missionaries from the new order were chosen instead. Nunez Baretto was elevated to the dignity of Patriarch, and Andre Oviedo appointed provisional successor.

At that period, the navigation of the Red Sea was rendered dangerous by numerous Saracen fleets, and the Patriarch deeming it inexpedient to hazard his own valuable person in the perils of the voyage, reposed quietly at Goa; whilst a deputation, headed by Gonsalvez Rodrigues, a priest of the secondary rank, was despatched in advance to ascertain the capabilities of the route, and the sentiments of the reigning monarch.

The Emperor Claudius little relished the arrival of these monks, and Rodrigues entirely failed in every attempt at conviction on the points at issue—that the Pope, as representative of Christ upon earth, was the true head of all Christians, and that there was no salvation whatever out of the pale of the Catholic Church; he was dismissed with the reply, that the people of Ethiopia would not lightly abandon the faith of their forefathers. The monk retired to work upon the mind of the monarch by the brilliancy of his controversial writing, but a lengthy treatise on the true faith produced no happy result, and the envoy, disgusted with his reception, returned shortly afterwards to Goa.

The spiritual conclave was plunged into consternation by the unhappy intelligence, and after much mature deliberation it was resolved, that the dignity of the Patriarch and of the great king of Portugal could not be exposed to the consequences attending the ill favor of the Emperor of Abyssinia, that therefore the prelate should still remain the guest of the Bishop of Nicaca; whilst the daring and restless Oviedo, with a small train of attendants, attempted the conquest.

Arriving in safety, the Jesuit experienced a most friendly reception from the Emperor Claudius, and although the letters of recommendation from the Pope were received with mistrust and impatience, the habitual mildness of the monarch restrained him from any overt act of oppression. Deceived by this calm behaviour during a second audience, the Bishop was sufficiently fool-hardy to represent, in the most insolent language, the enormous errors under which the Emperor laboured, and to demand imperatively, whether or not he intended to submit himself to the authority of the successor of St. Petér, and thus remove the heavy obligation under which his empire already groaned? King Claudius replied, that he was well inclined towards the Portuguese nation; that he would grant them lands and settlements in his country; that permission would not be withheld to the private exercise of the religion of the West; but that as the Abyssinian Church had been for ages united to the charge of the Patriarch of Alexandria, a subject of such serious alteration must be canvassed before a full assembly of divines.

Indignant at what he termed Ethiopian perfidy, but still buoyed up with the faint hope of realizing his object, Oviedo changed his mode of attack, and addressed a laboured remonstrance to the monarch, written in the hypocritical tone of false friendship; earnestly entreating him to recall to his remembrance the assistance rendered by Europeans to his afflicted country, and the many promises made by his sire in the day of his urgent distress, imploring him at the same time to preserve a stern vigilance upon the evil influence of the empress, and of the ministers of state; for in matters of faith, the love of kindred must give away to the love of Christ, and in similar situations, the nearest relation often proves the bitterest enemy to the salvation of the soul.

This insidious reasoning was, however, vainly expended upon the intelligent Claudius, and served but to turn his heart further from the Roman and his cause. The offer of a public controversy on points of disputed faith being shortly afterwards accepted, the emperor entered the lists in presence of the assembled court, and utterly defeated the subtleties of the Italian priest by his clear knowledge of the Holy Scriptures; and thus, notwithstanding the conviction of the Portuguese Missionary, that by supernatural aid he had triumphantly refuted all the arguments urged by his illustrious antagoinst, it was fully decreed by the Abyssinian conference, that neither king nor people, owed obligation or obedience whatsoever to the Church of Rome.

Still Oviedo was by no means reduced to silence. Treatise after treatise was published on the controversy, to confound the minds of the Ethiopians. The errors of the Alexandrian faith were fiercely attacked in every form and fashion, and the superior beauties of the Catholic religion fully expounded. But no advantage resulted, rejoinders and confutations followed fast from the insulted clergy, and the Bishop furious at the thoughts of his futile exertions to gain a footing in the country, entertaining no hope of making one single convert, whether among prince or people; resolved upon a last effort in the struggle, and on the fifth of February 1559, he issued his spiritual ban over the land, proclaiming that the entire nation of Abyssinia, high and low, learned and ignorant, having refused to obey the Church of Rome, practising the unholy rite of circumcision, objecting to eat the flesh of the hog and the hare, and indulging in many other flagrant enormities, were delivered over to the judgment of the spiritual courts, to be punished in persons and goods, in public and in private, by every means the faithful could devise.

The folly of issuing this curious rescript without any means of enforcement was fully appreciated, and the tyrannical conduct of the Bishop only served to strengthen the emperor in the bands of his own faith; finding, as was observed by an historian of the times, that Popery and its wiles were the more dangerous and reprehensible, as the veil was withdrawn from the spirit of her tenets.

There is every reason to believe, that the succeeding invasion of the Adaiel was procured through the treacherous designs of the Jesuits, but the event again proved disastrous to their cause. Although the revenge of the baffled Bishop was allayed in a torrent of blood, yet the death of the mild, moderate and liberal Claudius, who perished in the field of battle, shed a baneful influence on the ensuing efforts, and the sceptre devolved into the hands of his brother Adam, a haughty and vindictive prince, who is depicted in Portuguese records as cruel and hard of heart, and utterly insensible to the beauteous mysteries of the Catholic faith.

Swearing vengeance against the Latins, to whose treason he attributed the murder of his brother and the ruin of his country, the new monarch seized all the estates which had been granted to the Portuguese for rendered service; threatened the Bishop and his colleagues with instant death if they presumed to propagate the errors of the Romish

Church, and on a humble remonstrance being attempted, in the violence of his wrath he rushed upon the Missionary with drawn sword, vowing to immolate him on the spot. The weapon, however, say the holy fathers, dropped miraculously from his impious hand, and for a season the last extremity of vengeance was exchanged for a system of vile durance.

Portuguese troops in the mean time arrived from Goa, and the Bharnegash, the lord of the sea coast, bought over by the gold of India, and stirred up by the wily emissaries of the viceroy, assembled his forces in rebellion, and marching with his European allies to the capital, defeated and slew the emperor in a pitched battle, and rescued the Jesuit missionaries from their unpleasant captivity.

Warned by former difficulty and distress, the worthy fathers now assumed a more modest and humble demeanor, and were allowed to settle again in their old haunt of Maignagna, where they remained for a time unmolested by the new emperor, Malac Sarshed, who inherited all the horror of his father to the Catholic creed, although tempered by the mildness of his uncle Claudius. But the jealous monks had not yet relinquished their hope of advancement, and bending to the pressure of the times, the deep plot was veiled under the garb of passive obedience. The most pressing solicitations were dispatched to Goa for assistance, and the dauntless Oviedo pledged himself, with six hundred staunch Europeans, to convert not only the empire of Abyssinia, but all the adjacent countries.

The scheme, however, did not suit the politics of the day, and in 1560, the Bishop received an order from the head of his Society, to repair forthwith to his more promising charge in Japan; loath to abandon all his favorite projects of ambition in the country, and utterly reckless of truth, he addressed the most specious letters to the Pope, holding out a certain prospect of prostrating the Church of Ethiopia before the Apostolic throne; whilst to his immediate superior, he dilated upon the richness of the land and the mines of pure gold, which he falsely asserted to exist in every province of the kingdom. But his artful motives were thoroughly pierced by the more wily successor of St. Peter, and vessels soon after arrived on the coast of Africa, to convey the reluctant fathers to the Monastery of St. Xavier in Goa.

(Signed) D. C. GRAHAM, *Captain,*
Principal Assistant to the Embassy.

History of the Abyssinian Church.—Continued.

Miserable indeed appeared the chance of conversion, and after a fierce struggle of thirty years, there remained not one priest of the Romish faith, to administer the Sacraments to the numerous European settlers and descendants in the country. Even the Jesuits themselves lost heart for the time; but the zeal of Philip the Second stirred the dying embers, and fresh candidates for strife, honor, and martyrdom, were soon in the field.

Peter Pero Pays and Antonio de Mantzerado, disguised as Armenian merchants, first attempted the perilous quest, but being wrecked on the Arabian coast, they were recognized as Christian ministers, and languished during seven years in a Moslem dungeon.

Goa next poured forth her priests to the ineffectual contest in seeking the promised land. Abraham de Georgis was discovered in Turkish garb on the island of Massowah, and the governor swore by the Holy Prophet, that since the Kafir had donned the attire of the true believer, he should also adopt the tenets of the true faith, or die the death of a dog. But the Jesuit clung to his creed and suffered accordingly, and shortly afterwards Jean Baptiste being detected in the assumed costume by the Turks of Commera, he also shared the same fate as his immediate predecessor in the thorny path of martyrdom.

Thus even the road itself seemed to close, and all intercourse was denied with a country, wherein the presence of Europeans was neither sought for nor desired; and which would have been suffered to remain unmolested, had not ideas been inflamed by the exaggerated accounts of its wealth, that still pervaded the imagination of all classes throughout the Western world.

Don Alexis de Menezes, the zealous Archbishop of Goa, who had already with fire and sword propagated Christianity in all Malabar, now entered the lists, and his sagacious and discerning mind selected the vicar of St. Anne as a fit tool for the execution of his project. Melchior Sylva, a converted Brahmin, might from his colour and language pass through the Turkish wicket; his zeal was great as that of his superior, and the valuable presents whereof he was made the bearer, might prove a bait sufficiently tempting to lure the simple Abyssinian into a fresh connexion.

The intelligence of his safe arrival, and of the gracious reception of the presents again roused the ardent spirit of the order of Jesus, and Peter Pays was quickly ransomed from the Arabs, and despatched with a full train of priests to Ethiopia, where he arrived in September of the year 1603.

Superior in every respect to his predecessors, this Missionary instead of attempting to carry his measures by force and overbearing insolence, sought the softer path of insinuation; and whilst his extensive knowledge and plausible address proved strong recommendations in his favor, many circumstances also conspired to forward his views. The country was in a most unsettled state, and the assistance of a few Portuguese troops could turn the scale of war. The condition of the Church was low and miserable. Eight years of incessant strife and distraction had crushed the very name of learning and literature. Few persons were to be found, who could read, write, or dispute. Ignorant and unworthy men filled every sacred office, and the ancient stout defenders of the Alexandrian faith, had been swept away on the battle field.

Amidst wars and rumours of wars, Peter quietly settled with his followers at Maignagna. Schools were opened, and the wonder ran through the land, that youths of tender age could refute the most learned sages of the wilderness of Walpayet. The curiosity of Za Denghel, the temporary occupant of the throne was excited, and Peter with his erudite pupils was summoned to the court.

Prompted by the hope of obtaining assistance from Portugal, this weak prince, under an oath of secrecy, immediately embraced the religion of his guest. But his time was fully occupied in the more worldly object of strengthening himself upon a throne, to which he had been elevated by his evil genius, and the falling away from the faith of his forefathers being at length whispered abroad, a rebellion broke over his devoted head.

The approaching storm having been perceived by the monk, he withdrew from court before the burst of a revolution, which for some time crushed his every hope of success. The emperor was slain, new aspirants strove for the ascendancy, and war reigned for a season throughout the entire land.

Confident in the near approach of the Portuguese troops which had been requested when Sylva carried to India the tidings of the first conversion;

Peter now resolved upon the bold game of espousing the weaker party, and thus gaining a firmer hold in the event of success. The expected re-enforcements did not however arrive in time, and the defeat and death of his *protegé* was followed by the advancement of the pretender Sunscus to the throne of the empire.

Notwithstanding his appearance as a declared partizan in the opposing ranks, Peter's abilities as an architect now created a fresh diversion in his favor. The novel idea of a two-storied edifice engrossed the thoughts of the reigning king, and men flocked from the remotest parts of the country to gaze upon a fabric of stone, which was considered to be one of the wonders of the world.

A Missionary possessing the varied abilities and acquirements of Pays, could not be long in gaining ascendancy over a rude and illiterate monarch, and by address and perseverance, he had soon effected that which the threats and violence of his predecessors had vainly attempted during a long course of years.

Ras Cella Christoo, brother to the emperor, was the first fruit of the harvest. Partaking of the Holy Supper with the Latins, he publicly embraced their religion, and many chiefs and nobles followed his illustrious example. Crowded assemblies were held, in which the eloquence of the Jesuit entirely bore done the feeble efforts of the ignorant and uncultivated natives. The holiness of life, which was strictly preserved among the neophytes of the Catholics, added to the impression entertained of their wisdom, and the introduction of useful arts, raised the glory of the fathers still higher in the land, and the prospect of the aid of disciplined soldiers from the West overturned the last remaining scruple in the mind of the monarch.

An edict was published, interdicting all persons from holding office, who were not well inclined towards the Latin religion, and severe punishments were threatened for the promulgation of ancient doctrines. Assistance was solicited from Rome and Lisbon, and the work of European persecution favorably commenced by scourging with whips, all those stubborn monks who refused to forego their ancient belief.

Abba Simeon, the Abuna, repaired to the court to remonstrate with the emperor on the scandalous interference with his prerogatives in convening meetings and authorizing debates upon ecclesiastical matters ; but his pride was timely soothed by the royal assurance, that all had been undertaken for the benefit of true religion, and that the subject should be fully discussed in his own presence. Again the subtleties and dialectics of the Missionaries prevailed, and the total defeat of the Abuna and his clergy was followed by a second and more severe ordinance, awarding the penalty of death to all who should henceforth deny the two natures of Christ.

Wonderful was the sensation created by this severe edict, so diametrically at variance with the mild spirit of religion, and with all the ancient usages of the land. Aware of the feelings of the strong party at court, as well as of the entire body of the people, the Abuna placarded on the doors of the chapel an excommunication to all who should accept the religion of the Franks, and the monarch irritated by this resistance, published a manifesto, that his subjects should forthwith embrace the Catholic faith.

This served as the signal trumpet for the fight. All classes armed themselves in defence of their religion, and Aclius, the king's son-in-law, placed himself at the head of the malcontents in Tigre.

Not yet thoroughly prepared for the struggle, the emperor found it convenient for a time to temporize, and requested one further debate, which was to prove final between the disputants. The mild Abuna listened to the proposal, and accompanied by a large train of monks appeared in the royal camp, whilst the Jesuit and his colleagues advanced into the arena from the opposite side. The controversy was renewed, and raged fiercely for six days; but disputes in religion cannot be adjusted by the reasoning of doctors, and the parties withdrew mutually incensed against each other.

One further effort was made to restore the disturbed harmony. The empress Hamilmala, and many of the courtiers, with tears implored the king to desist from his undertaking; and the Patriarch and the clergy throwing themselves prostrate on the earth, embraced his knees, and entreated him to turn a deaf ear to the poisonous insinuations of the deceitful Jesuits, and graciously to allow his subjects to remain faithful to the religion of their forefathers; but the heart of the monarch remained closed to the prayer. The Abuna quitted the court, plunged in the deepest distress, and a bloody war ensued, which shook the empire to its foundation.

When Aclius fully understood the last resolution taken by his father-in-law to defend the Catholics and their religion, he publicly appealed to the people of Tigre, and proclaimed that all who were disposed to embrace the Jesuitical faith might repair to the deluded emperor; whilst those who held to the ancient belief, should forthwith gather under his standard; and finding himself shortly afterwards at the head of a large army, he marched towards the royal camp, resolved to establish the ancient doctrine of the land, or to perish in the attempt.

The Abuna Simeon, who had attained the venerable age of one hundred years, joined the army of the defenders of the Alexandrian faith, and in giving his Patriarchal blessing assured the soldiery, that all who should fall in the combat died the death of a martyr, and would receive their reward in heaven. The desired effect was produced, and the hearts of the entire force burned with one eager zeal to meet the accursed enemies of their religion.

On the appearance of the inflamed force, a reconciliation was attempted, and the daughter of the emperor was made the bearer of terms to her rebel lord. Her tears and entreaties were however totally disregarded. The impetuous youth prepared for instant attack, and the princess had barely time to regain her father's tent, when hostilities were commenced.

The soldiers of the viceroy rushed furiously upon the royal encampment, and Aclius succeeded in forcing his way, at the head of a small body of troops, to the very pavilion of his father-in-law. But he was here struck from his horse by a stone, and stumbled upon the ground. A panic seized the army of the fallen leader, and the rabble casting away their arms, fled in all directions.

The aged Abuna found himself alone and deserted in the same spot which he had occupied during the attack. His years and high clerical learning disarmed the violence of the Abyssinian soldiery, but a Portuguese partizan at length threw himself upon the Patriarch, and regardless of his white and venerable hairs, transfixed him with a spear. A frightful massacre ensued, and the heads of the principal leaders of the unsuccessful rebellion were exposed on the gates of the capital, as a bloody warning to the seditious.

Strengthened by this signal victory, other points of the Alexandrian creed were attacked in succession, and the time of the Jesuits was fully occupied in the translation into Ethiopic of sundry dogmatical treatises on subjects of disputed faith. But the barbarism of the language was despised by most. The Latin interpolation was abhorred as magic by all, and a furious paper controversy raged for a time until the Abyssinians becoming scurrilous, the wrath of the monarch was again roused, and he issued a severe edict, wherein the people were forbidden from celebrating the Jewish sabbath, which from time immemorial had hitherto been kept sacred.

The inhabitants of Begemder flew to arms, and people from all parts of the country groaning under the yoke of foreign oppression, poured in to join the standard of rebellion, which Joanel had reared on the plains of his government. A horde of Galla delighting in the confusion, offered their assistance, and the most haughty conditions were speedily conveyed to court from a large assembly in arms.

Again the most earnest entreaties were employed to induce the emperor to compromise; but influenced by the words of the Jesuits, he called together his principal chieftains, monks, and learned men, and in their presence solemnly declared, that he would defend the Catholic religion to the last drop of his blood, adding, that it was the first duty of his subjects to obey their legitimate monarch.

Energetic measures were forthwith agreed upon, and at the head of a large army, the king proceeded in person to the war. Joanel finding himself too weak to contend in the plains, withdrew to the inaccessible mountains, where the blockade of the royal troops soon caused a scarcity of provisions. His forces gradually deserted, and he himself escaping to the Galla, was pursued, betrayed, and put to death.

This reverse sustained by the defenders of the old cause, did not however intimidate the inhabitants of Damat, a province situated on the banks of the Nile; for hardly had the emperor reached his capital, than the population rose *en masse*, with the determination of dethroning a monarch, who so basely truckled to foreign yoke, and of driving from the land the authors of its destruction. An army of fourteen thousand warriors was speedily organized, and monks and hermits, burning with zeal in the cause emerged from the cave and from the wilderness, to join the fast swelling ranks.

Ras Cella Christos marched against the rebels, but desertion considerably thinned his troops, and he confronted the enemy with barely one-half the numerical strength of their formidable army. Governor of the province, and greatly beloved by the people, a proposal was tendered to him, that if he would only lend his assistance in burning the monkish books, and hanging the worthy fathers themselves upon tall trees, he might be seated upon the imperial throne of his ancestors. But the general despising the offer, and resting confidence in the firelocks of the Portuguese, rushed to the attack. The combat raged fiercely for a time. Four hundred monks devoting themselves to death, carried destruction through the royal host; but the tide of victory set at length in his favor, and after a fearful carnage on either side, he found himself master of the field.

Great rejoicings at court followed the news of this success. Peter declared that heaven, by the extermination of his enemies, had given the desired sign, that the Roman Catholic should be the religion of the land, and the emperor, who partly from fear of his subjects, and partly from dislike to relinquish his supernumerary wives and concubines, had not as yet publicly professed the Latin religion, now openly embraced the faith, and confessed his sins to the triumphant Jesuit.

A letter containing the royal sentiments was published for the benefit of the nation. "The king henceforth obeys the Pope of Rome, the successor of St. Peter, chief of the Apostles, who could neither err in doctrine nor in conduct, and all subjects are hereby advised to adopt the same creed." And the missionary who now reasonably imagined, that the work was satisfactorily concluded, wrote to the courts of Rome and Lisbon, requesting that a Patriarch and twenty ecclesiastics might be immediately sent to the vineyard, adding, that although the harvest was plentiful, the labourers were but few.

The happy tidings were received by Philip the Fourth of Spain; Mutio Vitelesse, the general of Jesuits offered to proceed in person, but the Pope refused permission, as had been the case with his predecessor Loyola, and Alphonse Mendez, a learned doctor of the Society of Jesus, was inaugurated at Lisbon with all the customary solemnities.

After suffering much difficulty and delay in his passage, the Portuguese Patriarch at length arrived on the Danakil coast, with a large train of priests, servants, masons, and musicians. The same greediness and cupidity were experienced amongst the savage Adaiel, that the traveller finds at the present day: baseness and avarice having stamped their character for generations; but the troubles of a weary march were soon forgotten in the cordial reception which awaited the party at the royal camp, and the day was finally fixed when the homage of the king and of the country should be rendered to the Pope of Rome.

On the 11th of February 1626, the court and the nobles of the land were assembled in the open air. Two rich thrones were occupied by the monarch and his distinguished guest, and a surrounding multitude gazed upon the imposing ceremony in silence. The hour is come, exclaimed Mendez, when the king shall satisfy the debt of his ancestors, and submit himself and his people to the only true head of the Church. A copy of the Gospel was produced, and the monarch falling upon his knees, took the oath of homage. " We king of the kings of Ethiopia, believe and confess, that the Pope of Rome is the true successor of the Apostle St. Peter, and that he holds the same power, dignity and dominion over the whole Christian church. Therefore we promise, offer, and swear sincere obedience to the holy father, Urban, by God's grace, Pope and our Lord, and throw humbly at his feet our person and our kingdom."

As the emperor rose from his position, Ras Cella Christos suddenly drawing his sword, shouted aloud : " What is now done, is done for ever, and whoso in future disclaims the act, shall taste the sharp edge of his trusty weapon. I do homage only to true Catholic kings." The monks, clergy, and noblemen followed the example of their superiors, and the assembly was closed by a public edict proclaimed through the royal herald, that all Abyssinians should, under pain of death, forthwith embrace the Roman religion.

Palaces and revenues were set apart for the ministers of the new faith. Seminaries for youth were established throughout the country, and baptism and ordination progressed in peace. The success of the Jesuits increased rapidly, and many thousand souls were enrolled, who had been converted from the delusions of the Alexandrian creed.

The trial of two years failed, however, to convince the nation of the benefits of the new religion, and the Emperor and Patriarch could not deceive themselves in the fact, that the cause advanced rather in appearance than in reality. Missionaries who entered the native churches were found murdered in their beds, the most disparaging stories were everywhere circulated regarding the holy fathers, and more particularly on the representation of Scriptural performances at the Paschal feast, when demons being introduced by Romans upon the stage, the spectators rushed simultaneously from the theatre exclaiming, "Alas they have brought with them devils from the infernal regions," and the tale spread like wildfire throughout the land.

Nothing daunted by the unfortunate fate of Aclius and Joanes, Tekla Georgis, another son-in-law of the emperor, with a large body of the discontented rose to defend the religion of their forefathers. Burning the crosses and rosaries together with a Jesuit priest, who fell into their hands, the party rapidly increased, and the emperor was compelled to march an army to quell the insurrection. The rebels were completely routed by Rebaxus, the viceroy of Tigre, and all who fell into his hands, men, women and children, were barbarously massacred. Georgis and his sister Adera concealed themselves in a cave during three days, but were at length discovered and brought before the irritated emperor, and condemned, by the advice of the Jesuits, to be burned to death as a heretic. Georgis was allowed by the monarch publicly to solicit the Patriarch to be admitted into the Roman church, but it being afterwards considered politic to imagine that his intentions were insincere, the unfortunate prince was hung in front of the palace in presence of the whole court; and his devoted sister fifteen days afterwards, suffered the same fate upon the same tree; notwithstanding that the most strenuous efforts were made to save her life by the queen, and by all classes of society.

To increase the dread effects of his tyranny, the emperor now issued a manifesto, that even as he had punished with death the obstinacy of his own son-in-law, so he would of a surety not spare any who in future committed a like transgression. The remarks of the worthy missionary Antoine regarding this execution, will shew the spirit which animated the fathers in their course of persecution, so novel in the annals of Abyssinia, and so contrary to the mildness of the Christian faith. He who reads with attention the history of Ethiopia will observe, that at no previous period was such ardent zeal displayed for the honor of religion, and a direct miracle indeed must have induced the emperor to hang his own son-in-law in the blessed cause.

Dazzled by the success that had hitherto attended their measures, the Patriarch and his colleagues now plunged headlong into proceedings which eventually proved disastrous to their cause. Excommunications were lightly launched in civil disputes, and the souls of the royal councillors of the state were committed to the devil for daring to question the authority of the foreign priest. Conspiracies were hatched against the imperial person, and the body of a distinguished nonconformist ecclesiastic, which had been interred within the walls of the church, was exhumed by the orders of the Portuguese prelate, and thrown to the wild beasts; an action which raised the indignation of the Ethiopians to the highest pitch against a set of men, who had ever the words of religion in their mouth; but who, after persecuting the living, denied even to the dead that repose which neither Pagan nor Mahomedan ever disturbed.

The detestation of the fathers and their religion daily waxed stronger in the hearts of all. Their great patron, Ras Cella Christos, was deprived of power and property for seditious attempts, and the bold mountaineers of Begemedet at length seized their long spears to uphold the faith of their ancestors. The viceroy was driven from the province, and Malcaus, a youth of royal blood appointed defender of the ancient religion, and leader of the armed host of peasants, who flocked to his standard from all parts of the country; but especially from Lasta, the seat of the bravest warriors of the land.

To quell this insurrection, the emperor assembled in Godjam an army of twenty-five thousand men, and attacked the insurgents among their strong-holds. His troops were, however, repulsed at all points, with the loss of many officers and men, and he was reluctantly obliged to retreat to the plains. Deputies followed from the victorious camp, to supplicate him to take pity upon his subjects, and to dismiss those evil-minded strangers, who had so long oppressed Abyssinia. The royal army was in no heart or condition to renew hostilities; rumours went through the land that angels sent from heaven had proclaimed the restoration of the ancient religion, and in the general excitement the king perceived that his own authority would be fatally compromised, unless some concessions were made.

But the Patriarch was inflexible, and letters were at the same time received from Rome, instigating the emperor to combat stoutly with his rebellious subjects, and extending to Ethiopia the general absolution of the great year of Jubilee. The unhappy inhabitants laughed to scorn the offer of this indulgence, and were utterly unable to comprehend, by what authority the Pope held in his possession the keys of the kingdom of heaven.

Meanwhile the civil war continued with great expenditure of life, and alternate success on either side. Enticed on to the plain, the enemy were generally worsted by the royal troops; but among the recesses of their native rocks, the mountaineers had always the advantage. No sign of intended submission could be observed, and the monarch becoming suspicious of the Jesuits, who were erecting posts and strong-holds under the guise of churches and residences, lent a favourable ear to the entreaties of his subjects.

A second remonstrance was penned, wherein he forcibly set forth to the Portuguese Bishop, that the Roman religion had not been introduced into the country by the miracles or the preaching of the fathers; but by royal edict and ordinance, in opposition to the wish of the entire population, and that the prelate must devise some milder measure, for the furtherance of the true faith.

Foreseeing a heavy storm in abeyance in case of refusal, Mendez reluctantly complied with the proposal of a modified church code, under the restriction, that no public manifesto should announce the change, which must be gradually and silently introduced.

The ancient liturgy and the ancient holidays were thus restored, and the celebration of the Jewish sabbath once again permitted.

But the concession was insufficient, and came too late to pacify the turbulent mountaineers of Lasta, who had been altogether victorious during the war. They would listen to no modification of their first demand; but imperatively insisted upon the complete establishment of their ancient ecclesiastical institutions, together with the expulsion of the foreigners from the land.

The liberty and the customs of highlanders are seldom invaded with success, and a religion detested by the common people, cannot without much difficulty be introduced by the prince. Weary of so many rebellions, and murders, and excommunications, the king in his advanced age, began to view with an unfavorable eye the firebrand authors of these disturbances. Suspecting his brother and the Patriarch of suspicious views; offended by the contumacy of his subjects, and the increasing diminution of his own authority; disgusted with the present state of affairs, and apprehensive of future events; he now seriously bethought himself of restoring the church to its original footing; but the rebellion must in the first instance be quelled, and having with this view concluded an alliance with the Galla, he marched towards Lasta.

Twenty thousand peasants, confident of victory, descending from their mountains, rushed upon the plain to meet the royal force. The two armies for a time remained in sight in that still calmness which precedes an earthquake. At length the Galla cavalry dashing at full speed on the crowded masses of the enemy, threw them into complete confusion, a fierce combat lasted until the going down of the sun, and the field of battle was left covered with eight thousand bodies of the insurgents.

Throwing themselves prostrate before the triumphant monarch on this scene of carnage, the vanquished peasants expressed their grief in the following lively terms: " Who are these men," they asked with groans, " whom you now behold bathed in blood. Are they Moslem, or Pagan, or even the enemies of the kingdom? No, they are Christians—they are all thy subjects, knit together by the most tender bands of blood, friendship and affection. Those warriors who now lie lifeless at thy feet, would under a better government have proved the bulwarks of the throne, and the terror of those very men by whose hands they have fallen. The Pagans even blush at thy cruelty, and call thee renegade for having abandoned the religion of thy fathers. Cease, O emperor, in mercy cease, to prolong a struggle, which must end in the downfall of the throne, and the ruin of all religion in the land." The empress also mingled her tears with the groans of the wounded petitioners, and adjured the king for the love of God, and in the name of future generations, to take pity upon his subjects, and desist from performing a sepulchre for himself and for his family. " What have you gained by this battle?" she exclaimed, "you have introduced into the kingdom hordes of Pagan Gallas, who detest yourself equally as your religion; but futile will be your attempt to establish in Ethiopia a form of worship which is unknown to the greater part of your people, and to the remainder is known only to be resisted to the last drop of their blood."

These representations sunk deep into the heart of the emperor, and instead of proceeding in triumph to the capital, he retired to a secluded spot to give vent to his feelings, and bewail the loss he had created.

The Galla troops were dismissed, and having collected all the principal monks and clergy, he announced his resolution of allowing the nation to return to the faith of their forefathers.

Immediately on this intelligence, the Patriarch hurried with all the Jesuit fathers to soothe the ruffled mood of the monarch! "I had fondly imagined," exclaimed Mendez, "that we were the victors, but behold we are the vanquished, and the rebels routed and put to flight, have obtained all that they desired. Call to mind how many fields thou hast won with the assistance of God and the Portuguese, and remember that thou didst embrace the true faith of thine own free will. We have been sent unto the charge by the Pope of Rome and by the king of Portugal, —beware of irritating great potentates to just indignation. They be indeed far off, but God is nigh at hand, and thy apostacy will defile thy name and that of thy nation, and leave an impenetrable stain upon the lion of the tribe of Judah which glitters in the standard of Ethiopia."

On the conclusion of this harangue all threw themselves at his feet, entreated an immediate order to execution, rather than a confirmation from his lips of the rash resolution he had taken.

Retaining a too lively recollection of the streams of blood that had been poured out upon the plains of Lasta, the emperor quietly allowed the Jesuits to arise, and unmoved by their earnest prayers and entreaties, replied shortly,—that his adherence to the Catholic faith had already caused the slaughter of a greater portion of his subjects, and that he would have no further dealings whatever with their doctrines.

The film fell from before the eyes of the discomfited monks. The friends of the Alexandrian faith rallying round the throne, united their utmost efforts to strengthen the emperor in his resolves, and the rumour spread abroad, that on the fast of St. John the Baptist, the ancient religion was to be re-established throughout the land.

Thousands assembled in the capital on that day to assist in the ceremony, and although temporarily disappointed, the clergy proved that this act of justice could no longer be safely delayed.

Every art and stratagem was still resorted to by the Patriarch to put off the evil day, but the emperor roused at length by the harsh and uncompromising character of the Jesuit, fiercely exclaimed: "Has then the sceptre departed from mine hand for ever?" and the royal trumpets suddenly sounded through the streets of Gendar, as the herald announced the following proclamation to the empire.

"Listen and hear, we formerly recommended to you the adoption of the Roman Catholic creed, on the firm conviction, that it was the only true one; but numbers of our subjects having sacrificed their lives for the religion of their ancestors, and we henceforth accord its free exercise unto all. Let the priests resume possession of their churches, and worship the God of their forefathers. Farewell and rejoice."

It is not possible to describe the rapture with which this welcome edict was received. The praises of the emperor resounded from every quarter.

The rosaries and the chaplets of the Jesuits were tossed out of doors and burnt in a heap. Men and women danced for joy in the streets, and the song of liberation burst from the lips of the disenthralled multitude.

> "The flock of Ethiopia has escaped from the hyenas of the West.
> The doctrine of St. Mark is the column of our Church.
> Let all rejoice, and sing Hallelujah;
> For the sun of our deliverance has lighted up the land."

Sunscus did not long survive this victory over himself, for a slow fever carried him off during the month of September of the same year, and his son Basilides was called to the throne. His first act was the suppression of a conspiracy raised against him by the Jesuits, who were in consequence deprived of their arms and munitions of war, and exiled from Maignagna. The obstinate prelate long refused to submit to this order, until his effects having been plundered by the banditti, he also, after destroying the pictures and sacred utensils of the church, withdrew from the province for ever.

Still the fathers had not relinquished all hope of exciting disorder in Ethiopia, and finding their profit in the troubled waters. Entering into a treaty with the rebellious chieftain Johannes Akayus, upon condition of protection, they promised liberal supplies from India, both of money and Portuguese soldiers; but the emperor being soon made acquainted with the arrangement, expelled and commanded them to repair forthwith to Massowah.

The banished foreigners lay for some time concealed among the mountains, awaiting the expected succours from Goa; but the Patriarch feeling insecure in his hiding place, escaped with great difficulty to the sea coast, where he was seized by the Turks, and for a season forced to work like a slave. Before taking leave of Akayus, his consent had been obtained to the sojourn of four Jesuits until assistance should arrive from the Portuguese possessions. Five years, however, elapsed without any accomplishment of their hopes, and they were finally delivered up to the Abyssinian monarch, who exiled them as traitors to the province of Lasta, where falling into the grasp of the infuriated populace, they were hung upon a tall tree to expiate their ambitious zeal.

After much persecution and insults at the hands of the Turks, and extreme suffering from the intolerable heat of the climate, the Patriarch was ransomed for the sum of four thousand dollars, and landed at Goa, where he sedulously employed himself in raising troops for the conquest of Abyssinia. Father Lobo was despatched to Europe in order to demand military assistance, which was never granted, and all the prelate's endeavours proving unsuccessful, he was at length reluctantly compelled to abandon the project in despair.

Thus terminated the labours of a mission, which for craft and cruelty has been seldom equalled in the annals of time. Whilst Rome must indeed have been prompted by no ordinary motion, to persevere so pertinaciously in a work of conversion through all the horrors of banishment and martyrdom, the unworthy means resorted to by the dauntless, but unsuccessful agents employed in the enterprize, have left an indelible stain upon the page of her history.

(Signed) D. Graham, *Captain,*
Principal Assistant to the Embassy.

(True Copies.)
Signed) J. P. Willoughby,
Secretary to the Government of Bombay.

Proceedings of the Asiatic Society.

(Wednesday Evening, 4th August, 1843.)

The usual Monthly Meeting was held at the Society's Rooms, on Wednesday evening at 8½ P. M. The Honorable the President in the chair.

The following new members were proposed:—

Major W. Anderson, B. H. A.—Proposed by H. Torrens, Esq., seconded by Capt. Broome, B. A.

Dr. Mouat, B. M. S.—Proposed by J. Thomason, Esq., seconded by H. Torrens, Esq.

Capt. Stephen, B. N. I.—Proposed by J. Thomason, Esq., seconded by Mr. H. Piddington.

M. Adolphe Delessert, author of "*Souvenirs d'un Voyage dans l Inde*" was introduced to the Society, and upon the motion of Colonel Forbes, seconded by Mr. Torrens, was unanimously elected an Associate and Corresponding Member: the usual communication of the rules, &c. was ordered to be made to him.

The following list of Books presented and purchased was read:—

Books received for the Meeting of the Asiatic Society, for July, 1843.

Naturalist's Library—Ichthyology, vol. iv. British Fishes, vol. i. by R. Hamilton. Edinburgh, 1843.—Purchased.

The Oriental Christian Spectator, July 1843, vol. iv. No. 7. Bombay.—Presented by the Editor.

London Edinburgh and Dublin Philosophical Magazine and Journal of Science, 3d Series, vol. 22. Nos. 143-144, February and March, 1843.

The Annals and Magazine of Natural History, London, vol. 11. No. 69, March 1843.

Chapitre inconnu du Coran, par M. G. de Tassy. Paris 1842, Pamphlet.—Presented by the Translator.

Julien, Simple exposé d'un fait honorable, odiensment denaturé dans un libelle récent de M. Pauthier. Paris, 184?, Pamphlet presentad by the Author.

Journal des Savants, for November and December 1842, and Janvier 1843. Paris purchased.

Meteorological Register for Calcutta, for the month of June 1843. Surveyor General's Office.

Mineral Resources of Southern India, by Lieut. (now Capt.) Newbold, F.R.S. &c.—Presented by the Author.

Penny Cyclopedia, vol. 1 to 24.

The Secretary called the attention of the Meeting to the absolute necessity for the purchase of books of standard merit, for reference in the various departments of the natural sciences. He stated, that while the Society's splendid and increasing collections in Zoology, Osteology, Paleontology, Geology, Mineralogy, and their various subordinate branches, were daily increasing, and likely to increase, the Curators, who were its paid and working officers in all these and other departments, were obliged to find the necessary works of reference as they best could, in their own libraries, or in those of others, and thus much valuable time was lost, and many sources of information were closed to them from the frequent impossibility of procuring rare, or costly, or little known works, and from the want of those recent ones which afford the knowledge of the current and hourly changing state of science at home; and that without such works it was most unfair, as well as impossible, to expect that the duties of the Curators and the Editorship of the Society's Journal could be conducted in a manner fully creditable to the high reputation of the Society. He had therefore presented this evening the following works for the inspection of the Society, and for purchase, if these views were approved of:—

Cuvier, Histoire Naturelle de Mammifêres. Paris, 1824, 3 vols
Selby's British Ornithology, 2 vols.

And he proposed farther, that upon lists being prepared by the Curators, the purchase of such standard works as they may require be authorised.

Some members expressed a wish, that some of the literary departments of the Society's Library should also be better furnished, particularly those relative to Oriental matters. After some conversation, the purchase of the Penny Cyclopedia was authorised. Cuvier's Mammifêres was to remain till the decision of the Committee of Papers was known, and Selby's British Ornithology being considered as nearly superseded by later and better works of reference, was returned to the booksellers. It was farther agreed, that a memorandum should be circulated to the Committee of Papers on this subject.

Read the following letter from the Secretary to the Government of Bombay:—

No. 1460 of 1843.

From the Chief Secretary to the Government of Bombay, to H. Torrens, Esq., *Secretary to the Calcutta Branch of the Royal Asiatic Society.*

Political Department.

Sir,—I am directed by the Hon'ble the Governor in Council, to acknowledge the receipt of your letter, dated the 9th ultimo, and to inform you, that the 24 copies of the Vocabulary, by Captain Eastwick, of the Scindee Language therewith forwarded, have been received by me.

I have the honor to be, Sir,
Your most obedient Servant,
L. R. Reid,
Chief Secretary to Government.

Bombay Castle, 26th June, 1843.

No. 1625 of 1843.

From the Chief Secretary to the Government of Bombay, to H. Piddington, Esq., *Sub-Secretary Asiatic Society at Calcutta.*

Political Department.

Sir,—I am directed by the Hon'ble the Governor in Council, to acknowledge the receipt of your letter, dated the 10th of May last, and to acquaint, you for the information of the Committee of the Asiatic Society, that the packets which accompanied it, have been forwarded to Major Leech and Captain Eastwick.

I have the honor to be, Sir,
Your most obedient Servant,
L. R. Reid,
Chief Secretary.

Bombay Castle, 15th July, 1843.

Read the following letter from the Secretary :—

To F. J. HALLIDAY, *Esq. Secretary to Government of Bengal, Asiatic Society's Rooms, the* 21*st June,* 1843.

SIR,—With reference to Mr. Secretary Bushby's Letter, No. 446, dated the 31st March, 1841, I have the honor, by direction of the Hon'ble the President and Members of the Committee of Papers of the Asiatic Society, to submit a statement of Disbursements made by the Society on account of the Museum Economic Geology from February 1841 to May 1843 both the months inclusive amounting to Rupees 1,040 : 7 : 3, of which a considerable proportion is for postage and apparatus for the laboratory; and to request that the permission of the Hon'ble the Deputy Governor of Bengal may be obtained for the Sub-Treasurer to pay the amount to my receipt.

2. I am also desired to request, that His Honor will accord the Society authority to draw from the General Treasury monthly a sum not exceeding Rupees 64, for Establishment and Contingencies for the Museum Economic Geology, as exhibited in the margin, which after the experience of two years seems indispensably necessary for the efficient discharge of the duties of the Museum.

Establishment.

1 Writer, ...	Co's. Rs.	16
1 Carpenter, ...	,,	8
1 Peon, ...	,,	5
	,,	29
Contingencies,	,,	35
Co's. Rs. ...		64

3. The utmost care will be taken in conducting the outlay on such a scale of strict economy as to be kept within the Estimate for Contingencies. Should a surplus exist at the close of the year, it will be duly carried to credit on account of the ensuing twelve months, and special report made accordingly.

I have, &c.
H. TORRENS,
Vice President and Secretary Asiatic Society.

And the reply thereto, as follows :—

No. 691.

From Under-Secretary to the Government of Bengal, to H. TORRENS, ESQ., *Vice President and Secretary Asiatic Society, dated Fort William, 3d July,* 1843.

SIR,—I am directed by the Hon'ble the Deputy Governor of Bengal to acknowledge the receipt of your letter, dated the 21st ultimo, submitting a statement of Disbursements made by the Asiatic Society on account of the Museum Economic Geology, from February 1811 to May 1843, amounting to Rupees 1,040 : 7 : 3, and in reply to state, that the necessary instructions for payment of the same will be issued from the Financial Department to the Sub-Treasurer.

As regards the further request of the Society for authority to draw from the General Treasury a monthly sum of Rupees 64 for Establishment and Contingencies, for the Museum Economic Geology, I am desired to say, that a reference on the subject will be made to the Supreme Government.

I have the honor to be, Sir,
Your most obedient Servant,
A. TURNBULL,
Under-Secretary to the Government of Bengal.

Read the following letter from Professor J. Mohl of Paris :—

H. PIDDINGTON, ESQ., *Acting Secretary of the Asiatic Society of Bengal.*

SIR,—I have received your letter of the 6th of March, by which you inform me, that the Asiatic Society of Bengal has done me the honor to elect me a Member of the Society. I am very gratified for the great distinction thus conferred upon me, and beg you will have the kindness to lay before the Council of the Society, the expression of my thanks for it.

I have the honour to be, Sir,
Your very obedient Servant,
JULIUS MOHL.

Paris, 20th of May, 1843.

And the following extract of a private letter from M. Mohl, addressed to Mr. Piddington, as Acting Secretary of the Society, in reference to the incomplete presentation of works in the Society's Library. (See Proceedings of July.)

My dear Sir,—Allow me first to thank you for the part you have had the goodness to take in my election as Foreign Member of your Society; it is an honour which I appreciate very highly. I will try to answer on all the points on which you have written to our friend Troyer.

1st. The debt of the French Government to the Asiatic Society for copies of the Vedas must by this time be paid. It ought to have been done a long time ago.

2d. The books you want shall be bought and sent very shortly. I see that there is not money enough at the account of your Society, because the delay of the box containing the 4th vol. of the Mahabharat has stopt the sale of the book for a long time, and most people who have bought the 1st vol. have got impatient and sent to London for the last volume. But the books shall be bought notwithstanding.

3d. You have sent a list of books which have arrived incomplete; I will try to explain the matter as far as I can.

Agassiz, Hist. Nat. des Poissons 1er livraison. I do not think this was sent by our Society.

Cuvier Hist. des Poissons vol. i.—xvi. If a further vol. should have appeared, it shall be sent.

Quatremère Hist. des Mongols, vol. i. Is all that has appeared.

Mohl, Livre des Rois de Firdousi, vol. i. The second vol. has appeared and shall be sent.

Histoire Generale des Huns, vols. i. and ii. I am sure this was not sent by us.

Quatremère, Histoire des Sultans Mamelouks 1. et 2. Is all that has appeared, but a new vol. is coming out. It was not sent by us, but most likely by the Translating Fund in London, whose property it is.

Dubeux, Chronique de Tabari, vol. i. Is all that has appeared, the second vol. is printing; it is the Translating Fund's property.

Jacquemont, Voyage dans l'Inde, 13 livrs. There have appeared 45 livrs. till now. It was most likely sent by the French Minister of Public Instruction, and I will enquire why the rest has not yet been sent, and try to get it.

Vendidad Sadi, by Burnouf, nine numbers were sent by us; it is all that appeared, but the last number is printing, and shall be sent.

L'Espagne Artistique, 1 livr. was not sent by us.

Harivansa by Langlois, must have been sent by the Translating Fund, whose property it is.

Description de l'Egypte. I have no idea who has sent this. I asked about six years ago M. Thiers, then Minister of the Interior, to present a copy of it to your Society; it is possible he sent it through the Marine. I will try to get it completed, but am not sure to be able to do it. I know it is a most complicated business to get a copy of this work.

4th. I am afraid a large box of books sent by us must have been lost somewhere. Mr. Prinsep offered us to take charge of a number of copies of the Asiatic Society's books, to be sold in Calcutta, we sent in 1838, a few copies of each; amongst the rest, 12 copies of Mr. Troyer's Raja Tarangini, but we never heard of them again, and I do not find in your lists of books received any mention of them. Mr. Prinsep had advised me to address the books to the Governor General, as they would be then free of duty, and as the Governor General in the interval went to Upper India, it is possible the books may have followed him, and be left or lost somewhere. It is most likely quite useless to enquire now for them; but if you should believe that any of them would find buyers, I would be very happy to send another set. You will find the list on the cover of any number of our Journal.

Read, and approved, the following drafts of letters to Ministers of Foreign Courts, and to the Vice-Chancellors of Universities, to be sent with the presentations of the Society's Oriental works, as per resolution of the last Meeting, (See Proceedings of July,) and it was farther resolved, that communications should be opened with literary and scientific societies in Europe and America as occasion might offer.

To His Excellency the Minister of Public Instruction of France.

I have the honour, by direction of the President and Members of the Asiatic Society of Bengal, to forward to you two complete sets of each of the works noted in the margin, being standard works in (and upon) the Arabic, Sanscrit and Thibetan languages, published or deposited for sale with the Society.

The Society requests that you will place these books at the disposal of His Majesty the King of the French, with the expression of their respectful hope, that they may prove of sufficient interest to merit a place in the Royal Library, or in one of the Public Libraries of His Majesty's kingdom.

Should any works published, (as so many have munificently been by the French Government,) for the general benefit of science, be now in course of distribution to learned bodies, Colleges, and Societies in Europe, the Asiatic Society of Bengal would beg to inscribe its name as that of a constituted body labouring in the cause of general science, and earnestly desirous of reciprocating the presentation of works, the tendency of which is its advancement.

France, 2—Holland, 1—Prussia, 1—Austria, 1—Russia, 1—America, 1—Universities of Oxford, Cambridge Dublin, and Christiana.

To the Very Reverend the Vice Chancellor of the University of Oxford.

REV. SIR,—I have the honour, by direction of the Asiatic Society of Bengal, to forward to you for presentation to the University over which you preside, the books noted in the margin, being standard works in (and upon) the Arabic, Sanscrit, and Thibetan languages, published by or deposited for sale with the Society.

The Society begs that should any works published for distribution to learned bodies by the University, or under its patronage, be now in course of such distribution, its name may be inscribed as desirous of reciprocating the presentation of works, the tendency of which may be the advancement of science and literature.

No. II. of Mr. Heatly's Paper on the Mineral Resources of India, and a Memoir of Mr. Keir, one of the early speculators in various Indian products, were presented for the Journal, to the Editors of which they were referred.

Extract of a letter from Mr. Batten, C. S. dated Almorah, 17th July, was read, stating that Capt. Boyes, 6th L. C. (See Proceedings of June p. 521) had unfortunately only reached Milum in his progress towards the Passes, having there lost almost all his baggage by a sudden flood.

The following letter, accompanying a note on a Fossil Antelope, from the Dadoopoor Museum, by Capt. Baker, B. E., was presented with a very beautiful drawing, shewing the close relation of the Fossil to the African Antelope types, Acronotus Caama (the Hartebeeste,) and A. Lunata, (the Sassaybe,) with its deviation from the Indian Antelopes. This curious relation excited much interest, and the paper and plate will appear in an early number of the Journal.

To the Secretary of the Asiatic Society.

Dear Sir,—I have the pleasure to forward a paper for publication in the Journal of our Society, should you consider it suitable for that purpose. I am about sending the *elite* of my Fossils to Europe, and will, if I can find time, send you a brief notice of the most remarkable among them.

Believe me, dear Sir,
Kurnaul, July 21, 1843
Yours sincerely,
W. E. Baker.

Read the following letter from Captain D. Williams, first Assistant to the Commissioner, Arracan, accompanying two Gold Coins presented by him to the Society.

Ramree, Arracan, 5th July, 1843.

Dear Sir,—I have now the pleasure to send you, for presentation to the Asiatic Society, two of the gold coins found on Cheduba Island, they are the most perfect of those found.

The Natives who found them tell me, they were dug up out of the sand on the Sea beach, about 100 yards from the Sea, scattered about.

I shall feel obliged if you will let me know what country, &c. these coins belonged to, as I can gather no information on the subject from the Mugs.

Yours truly,
D. Williams.

The coins have not yet been recognised, and we are inclined to consider them, if not Siamese or Burmese, of a very early Hindoo type, perhaps even as far back as the dynasties under which the Hindoos were a navigating and a colonising people. They are of thin sheet gold, rudely cut out, 1.4 and 1.3 inches in diameter, but weighing only 76.5 and 77 grains, and stamped on one side only. The central emblem is an elephant surrounded by monograms or symbols. We shall take an early opportunity of lithographing these curious reliques.

Read a paper "On an improved Sympiesometer," called "The Tropical Tempest Sympiesometer," by Mr. H. Piddington. The instrument was also exhibited, and the paper referred to the Journal.

Read "Memorandum on Zoological Desiderata from Arabia," by E. Blyth, Esq. the Society's Curator, intended for transmission to Aden and other parts in that neighbourhood.

Read the following letter from Major W. Anderson, B. H. A. accompanying 19 bags of specimens therein alluded to:—

To the Vice President and Secretary to the Asiatic Society.

MY DEAR TORRENS,—I have the pleasure to send you the various bags of musters. On looking them over, I fear they are not so valuable as I had hoped, but as they are, I should like a good professional report, as to quality, use, and price here, which information from their own country I have in Persian, and will prepare.

1. Roodung
2. Pistah.
3. Zureesh
4. Hanab.
5. Hing.
6. Buz Gung.
7. Zeeruh Sufueed.
8. Gul Kajuree.
9. Alooee Eerance.
10. Teerungabeen.
11. Zaj.
12. Keermuz.
13. Sualob Misree.
14. Sulphur from Bagh.
15. Gum used to fix or dry paint.
16. Safflower, I suspect.
17. Teerungbaeen.
18. Toolcæ.
19. Zumah Bulooree.

Your's sincerely,
WM. ANDERSON.

Ichapoor, 26th July, 1843.

A paper on "The Mineral Resources of Southern India," by Lieut. (now Capt.) Newbold, M. N. I. was presented by the author.

Read a letter from A. A Sevestre, Esq. giving cover to his subscription of 50 rupees, towards the Portrait of the Hon'ble Mr. Prinsep.

Report of the Curator of Museum Economic Geology, &c.

Geological and Mineralogical Department.—We have to announce here the contribution of a very handsome little suite of Geological specimens from Almorah to Mullarie, sent by our new and zealous member, Capt. Boyes of the 6th Light Cavalry. These specimens are unfortunately small, but they are accompanied by a capital

Map of the localities, and an accurate catalogue of them, to which illness has prevented me from adding the Mineralogical designations.

Museum of Economic Geology.—I noted in my last Report that we have received a reference from Government on the subject of the Argentiferous Lead and Antimony Ore of Chota Nagpore, forwarded to Government by Colonel Ouseley ; I now present, with the correspondence, my Report to Government through our Secretary.

No. 576.

From Under-Secretary to the Government of Bengal, to H. TORRENS, ESQ., *Secretary to the Asiatic Society, Calcutta, dated Fort William, 5th June,* 1843.

SIR,—I am directed to forward to you, for the purpose of being submitted to your Society, the accompanying copy of a letter from the Agent to the Governor General S. W. Frontier to this Department, and certain Specimens of Argentiferous Galena alluded to in the letter. The Hon'ble the Deputy Governor of Bengal requests your Society will, in conjunction with Mr. Piddington, make such further enquiries and experiments as may be necessary, and report the result to this Department,

I have the honor to be, Sir,
Your most obedient Servant,
A. TURNBULL,
Under Secretary to the Government of Bengal

No. 24.

From Lieut. Col. J. R. OUSELEY, *Agent to the Governor General S. W. Frontier, to* T. R. DAVIDSON, *Esq., Secretary to the Government of Bengal, Fort William, dated 22d May,* 1843.

SIR,—Herewith I beg to forward specimen of Argentiferous Galena from a place N. N. West of this, named Hisato, for the inspection of the Hon'ble the Deputy Governor.

2d. From analysis here by Dr. Macrae, and the examination of it and tests applied by Mr. Piddington in Calcutta, reported in the Journal of the Asiatic Society, a very large proportion of silver is attainable. It may be considered desirable by the Government to make further inquiry, and if, as anticipated by Mr. Piddington, the results should prove so very profitable, adopt measures for working the mine, which is within the Zemindary of Ramgurh. The lead ore is abundant.

I have the honor to be, &c.
Chota Nagpore, 22d May, 1843. (Signed) J. R. OUSELEY,
Governor General's Agent.

P.S.—Despatched this day.

1 Specimen of Ore.
1 Ditto ditto
1 Small parcel with Matrix.

(True Copy,)
A. TURNBULL,
Under-Secretary to Government of Bengal.

H. TORRENS, ESQ., *Secretary of the Asiatic Society.*

SIR,—In reply to the reference to the Museum of Economic Geology by the Hon'ble the Deputy Governor in Council, accompanying a specimen of the ore and matrix forwarded by Major Ouseley from Hisato, 12 miles N. N. W. of Chota Nagpore, under date of June, 1843, I have the honor to report as follows :—

Map of the localities, and an accurate catalogue of them, to which illness has prevented me from adding the Mineralogical designations.

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Chota Nagpore, 22d May, 1843. (Signed) J. R. OUSELEY,
Governor General's Agent.

P.S.—Despatched this day.

1 Specimen of Ore.
1 Ditto ditto
1 Small parcel with Matrix.

(True Copy,)
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Under-Secretary to Government of Bengal.

H. TORRENS, ESQ., *Secretary of the Asiatic Society.*

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1. My former Report (Journal, vol. xi. p. 892,) to which Major Ouseley's Letter refers stated, not that " a very large proportion of silver was attainable," but simply that the proportion of silver then found " *would in Europe be thought worth working.*".

2. The present specimen is a less favourable one, giving a mere trace of silver, and this is a just instance of the uncertainty of these small laboratory trials of ores, especially as far as relates to the value of minute parts. No two experiments agree, and where the proportion of the valuable ore is a mere fraction, the results are of course always the more uncertain.

3 The appearance of the matrix, and the presence of the antimony are, as before remarked, favourable indications; *but they are nothing more,* and indeed my report might stop here, and be comprised in this, that the present specimen is an ore of little or no value in its present situation, and with present appearances, but offering indications worth farther investigation.

4. It may however be satisfactory to Government and to Major Ouseley to have the reasons upon which this view is founded, and I therefore take leave briefly to state them here, as it is specially within the province of our institution to explain matters of this nature.

5. In all mining, and indeed in many other countries, it has been well remarked, that it is not veins and ores that are wanting, but *profitable* ones. It was the ignorance or neglect of this great and first principle in mining speculations, which sacrificed so many millions of English capital in Mexico and South America. The agents of the Mining Companies could not, or would not, suppose that a *Silver mine,* or a mine which produced Silver ores could be a losing concern, and they bought up, at enormous prices, hundreds of spots from which indeed Silver was obtainable, but not to a profit.

6. In the case before us, we have, at the most, an ore of Lead and Antimony, with the minute portion or traces of Silver which always accompany these ores, and supposing it to be obtainable in any quantity, and at the cheapest possible price, or indeed for nothing, we should still require all the expensive resources of the best European Metallurgy, and establishments with scientific superintendence to render it a marketable article here. As a mere ore, it would probably not pay its carriage to Calcutta and freight to Europe.

7. In a spot then affording only favorable indications, and where we have assumed already much that is doubtful, it is clear that the first step is to know—

I. What the vein really is?

II. What are the facilities for, and difficulties against working it, and the expence attendant on all these and on the necessary superintendence?

III. What those for transporting the products to a market are?

I. The vein may be the outcrop of a rich mine, or it may be worthless or unworkable, or break off, even for Lead and Antimony, at 10 fathoms deep. It follows that a professional and a scientific man should first be sent to the spot with all necessary means, that a shaft or gallery should be dug, and the ores from it, as far as he can reach, be examined. This is necessarily and indispensably the first step.

II. During this examination, all questions relative to the facilities and difficulties likely to attend on the working would be inquired into, and in India these are far more than Europe, as the following enumeration of a few of them will shew: 1st, healthiness or unhealthiness of the site; 2d, possibility of obtaining workmen; 3d, of subsisting them; 4th, of erecting machinery, furnaces, and the like; 5th, fuel; 6th, drawing or pumping water; 7th, general cost of bringing the ore to *bank* (i. e. to the mouth of the mine;) 8th, cost of preparing, smelting, and produce of the metal at the furnace.

III. Supposing the metal or ore to be thus obtained at a profitable rate, it has yet to be taken to a market, and this involves all the questions of road, carriages, warehousing and agency in Calcutta, and perhaps even freight, insurance, duties and sale charges in England.

From the foregoing then it will be seen, that we can recommend at the most but a careful examination of the vein as an indispensable preliminary step; but this I should respectfully beg to do, because the locality being about the lines where the granite and stratified formations meet is a favourable one; because the appearance of the ore is favourable; and because it is really a question of much interest in a district so little known, and so near to Calcutta, to determine what it may really prove to be. I may mention, finally, that the matrix of the present specimen differs greatly from the one formerly sent. There may evidently be half a dozen other valuable mineral substances at this spot or near it, though considered as mere stones by those unacquainted with them. One of the richest of the silver ores, for instance, the muriate of silver, (not unfrequently found in company with such as the one under examination,) would in all probability be thought a worthless stone.

I have the honor to be, Sir,
Your obedient Servant,
H. PIDDINGTON,
Curator Museum of Economic Geology.

28th July, 1843.

P. S. In illustration of the closing remark of this report, that valuable ores of Silver (as of many other minerals) may easily be passed over as worthless stones, I beg to quote from Professor Jameson's Mineralogy, vol. iii. p. 75.

"In some parts of Mexico, however, as we are informed by Mr. Humboldt, the operations of the miner are directed to a mixture of ochry brown Iron ore and minutely disseminated native Silver.* This ochreous mixture, which is named *Pacos* in Peru, is the object of considerable operations at the mines of Angangneo in the intendancy of Valladolid, as well as at Yxtapexi in the province of Oaxaca."†

I am fortunately enabled to exhibit to the Society from my own collection, about twenty specimens of silver ores of various kinds, but mostly such as shew little or no appearance of metal, and several are the true *Pacos* from Peru, the inspection of which will at once convince the most sceptical of this curious fact. Humboldt indeed adds, that a very large proportion of the silver of Mexico and South America

---

* Of muriate of silver also.—H. P.

† *Pacos*, according to Klaproth, contains

Silver,	14	0
Brown Oxide of Iron, ...	71	0
Silica, sand, water, &c.	13	0

is obtained not from rich ores, but from the poor ones approaching to this remarkable mineral.

Memoranda by the Secretary and President.

I have the honor to lay before the Hon'ble the President, and the Members of the Committee of Papers, the report of the Curator of our Museum of Economic Geology upon Major Ouseley's specimen of an Ore from Chota Nagpore.

As the considerations contained in this report appear very sound and pertinent, I would submit whether the Society would not do well in addressing Government to call special attention to them.

How far such considerations might induce high authorities to propose attaching a practical master miner to the Department of Economic Geology confided to our Society, I of course cannot pretend to speculate upon; but it is evident, that unless local experiment be entered upon, the value of the ore in question as a profitable working ore can hardly be determined.

As Mr. Piddington's reflections apply equally to all newly discovered Indian mining sites, the employment of a professional miner on those of which we already know the existence, can alone lead to practical results.

H. TORRENS,
Vice President and Secretary.

29th July, 1843.

A copy of Mr. Piddington's report should, I think, be forwarded to Government in reply to the reference made to us on the subject. W. W. B.

At the close of the Meeting, the Hon'ble the President and Members were invited to view the tablet placed over the Asoka Stone, which we may state is placed on a stand beneath the pillar destined for the bust of the lamented James Prinsep. The tablet is one of pure white marble occupying a frame above, the Stone; and the inscription upon it in letters of gold is as follows:—

THIS EDICT OF ASOKA (B. C. 250)
IS HERE PLACED
BY THE ASIATIC SOCIETY OF BENGAL
IN HONOR OF
THE PHILOSOPHER THE ANTIQUARIAN
AND THE PHILOLOGIST
BY WHOM
ITS CHARACTERS WERE FIRST DECYPHERED
JAMES PRINSEP.

The President and Members expressed their high approbation of this arrangement, as a just tribute to the memory of their ever-to-be-lamented Secretary and Associate.

Oriental Publications for Sale, at REDUCED *prices, by the Asiatic Society.*

WORKS.	Rs.	Former Price.
Mahábhárata, vol. 1st. pages 831, vol. 2d, pages 868, vol. 3rd, pages 859. vol. 4th, pages 1007. royal 4to.	40	48
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JOURNAL

OF THE

ASIATIC SOCIETY.

As-Soyúti's work on Earthquakes, called كشف الصلصلة عن وصف الزلزلة للسيوطي *Kashf as-Salsalah 'an wasf Az-zalzalah,* i. e. *removing the noise from the description of the Earthquakes, (or clearing up the description of Earthquakes.) Translated from the Arabic by* A. Sprenger, *Esq. B. M. S.*

Jelal-ed-din as-Soyútí, an Egyptian polygrapher of some merit, died in A. H. 911. He wrote this work on the occasion of an earthquake in Egypt, with a view of showing to his countrymen by a number of traditions which have been omitted in this translation, that earthquakes are ordained by God to punish men for their sins. At the same time the author wished to console them by showing them from history, that much more frightful punishments of this kind had taken place than the one under which they suffered in his time. This translation has been made from an Arabic MS. of the Royal Library at Paris, (fonds Asselin N. 218) which is neither very correct nor legible. A better copy is preserved in the library at Gotha. This translation, was not made with the view that it should ever be published, but it was merely intended as a sort of a hasty memorandum for the translator, it will therefore probably not stand the criticism of the philologist, though the student of Natural Philosophy may rely, that the facts are in general correctly rendered into English.—A. S.

It would appear that this is the original of the Persian work known amongst the native literati of the Western Provinces, by the name of 'Zelzele Namah,' for which enquiry was made sometime ago by Lieut. Baird Smith. See Proceedings of Nov. 1842, Vol. xi, p. 1201. Upon our mentioning it to Dr. Sprenger, he expressed this opinion, and has been kind enough to place this curious little Treatise at our disposal for the Journal.—Eds.

A. H. 94. On the 20th of Adar (March) an earthquake in Syria, which lasted forty days. Many buildings were destroyed in Antiochia.

98. Again for forty days, during the Khalifat of Omar Ben Abdulaziz, in Syria.

130. There was an earthquake at Damascus, which was so violent, that the people were obliged to leave the town.

131. Several new shocks in Damascus.

180. In Egypt a very violent earthquake. The minaret of Alexandria was destroyed.

187. At Masisa المصيصة an earthquake and an inundation.

203. In Khorasan an earthquake which lasted seventy days; the mosque of Balkh and the fourth part of the town were destroyed.

219. Great darkness from noon until the evening.

220. Antiochia was destroyed by an earthquake, which lasted forty days.

224. An earthquake at Fergana, by which 15,000 persons perished.

225. An earthquake at Ahwaz for sixteen days; it was also felt in Jebal.

233. At Damascus many persons were buried under their houses; the earthquake extended to Antiochia, Mesopotamia, and Mausil. It is supposed that 50,000 persons perished.

232. Several earthquakes, more particularly in the Maghrib and in Syria, where the walls of Damascus and Emessa were destroyed. It was felt at Antiochia and El-Awassim العواصم in Mesopotamia and Mausil.

233. On Thursday, the 11th of Rabi-al-Akhar, many buildings were destroyed at Damascus by an earthquake.

234. At Herat, the houses were destroyed.

239. At Tiberias.

240. In the Maghrib, thirteen villages of Kairowan sunk.

242. In Shaban a very violent earthquake. At Tunis about 45,000 persons were buried under their houses; it extended also over Yemen, Khorasan, Fars, Syria, Bastam, بسطام Komm قم Kashan, قاشان Rai, الدامغان el-Damaghan, Nishapur, Taberistan and Ispahan. The mountains fell down, and the earth opened so extensively that men could walk into it; and in the village El-sud السود in Egypt, five stones fell from heaven. One stone fell on the tent of a Bedouin and set it on fire. The weight of these stones was ten rotles. In Yemen a hill covered with fields moved from its place and became the property of another tribe.

245. Earthquakes prevailed over the whole earth, and many towns and bridges were destroyed.

At Antiochia a mountain fell into the sea, with 1005 houses. It had been covered with about ninety villages. The river disappeared one farsang's distance. Dreadful noises were heard at Tinnis.

In Mecca all the springs disappeared. The earthquake extended over Rakka, Harran, Ras el-'Ain, Emessa, Damascus, Rokha, Tarsus, Massissa and Adina. On the shores of Syria, in Laodicea, mountains moved with their inhabitants, and when it had destroyed السن El-son, it crossed the Euphrates, and was felt in Khorassan.

249. In Dhul Hajj was a very violent earthquake, at Rai the houses fell down, and the people took flight into the fields.

258. At Wasit about 20,000 persons were buried under their houses, by an earthquake.

268. At Bagdad an earthquake, followed by torrents of rain and a thunder-storm.

280. At Ardebil six earthquakes took place in the course of this year; 100,000 persons died under the ruins of their houses. One of these earthquakes was preceded by an eclipse of the moon, darkness and wind.

288. An earthquake which lasted for some days.

289. In Rejeb at Bagdad, it lasted for some days.

On the day of Arafat which fell in summer, the wind was so cold, that the people were obliged to dress in furs.

300. A mountain split at Dinawar, and streams of water gushed out from it, which submerged many villages. A star split into three pieces, and this was followed by a frightful noise.

331. At Nesa many buildings tumbled down, and many people perished.

344. An earthquake in Egypt; it lasted three hours, and did great damage.

345. An earthquake at Hamadan, many lives were lost.

346. An earthquake at Rai and about that town, it lasted 40 days, then it discontinued for sometime, but it again returned. It extended to Talikân, and there sunk 150 villages belonging to Rai. At Rai a mountain sunk, and an enormous chasm opened from which water and smoke gushed out.

347. An earthquake at Komm, Holwan, Kaman and Jebal, many people perished; at the same time Bagdad suffered from an earthquake.

During the reign of Kafur the Akhshidian, repeated shocks of earthquakes visited Egypt within the space of six months.

362. Several castles in Syria were ruined by an earthquake.

363. At Wasit.

376. Many persons perished under the ruins caused by an earthquake.

393. In Syria, Abasim, and the Greek frontier, many castles were ruined by an earthquake.

398. In Shaban at Dinawar 10,000 persons perished under the ruins, besides those swallowed up by the ground. An inundation took place at Shiraz, and many ships were wrecked at sea.

During the reign of El-Hakim El-Obeidi, who ruled from 386 to 411 in Egypt, several earthquakes took place.

425. Many earthquakes took place in Egypt and Syria, by which one-third of Ramlah was destroyed. The walls of Jerusalem fell down, and many villages were swallowed up by the ground.

434. At Tebris, the fortress and the town were nearly destroyed by an earthquake, and about 40,000 persons perished. Many also perished at Tadmor and Balbek by the same cause.

438. Khelat and Diarbekr.

444. An earthquake in Ahwaz, by which much destruction was caused.

450. In the month of Shaban an earthquake at Bagdad, which extended to Hamadan and Tekrit.

455. Sha'ban; at Wasit, Antiochia, Laodicea, Sul, Akka and over all Syria. The walls of Tripolis were destroyed.

458. Jomadal Akhr in Khorassan, mountains were split, and many villages sunk under the inhabitants; some saved themselves by taking refuge in the open fields. Soyuti gives a copy of the document which was sent to Bagdad on this occasion. The earthquake is thus described:—"It caused the mountains to split; it cleft hills, overturned towns together with their inhabitants, and it levelled them with the ground in such a way that but few people escaped. Most buildings lay in ruins, and it is impossible to ascertain the number of those who perished."

تصدعت منها الجبال و تشققت منها التلال و انقلبت القرى
باهلها واستوصلت من اصلها و لم يسلم من ساكنها الا القليل
و خرب اكثر بنيان البلد وهلك خلق لا ياتي عليهم العدد

460. Tuesday 11th Jomadalawwal, an earthquake in Palestine: Ramla was destroyed. It extended to the Hejaz. It reached also Wadi El-Szafr, Khaiber, Bedr, Yanba, Wadi-kora, Teima and Tabuk, and it extended as far as Kufa; only two houses of Ramla remained, 25,000 persons perished. 'Aila was destroyed with all its inhabitants, the earthquake was also felt at Jerusalem. The sea receded from the coast, but soon returned again into its place. In all these countries it was felt at the same hour.

462. Tuesday 11th Jomadalawwal at Ramla, and its dependencies, Jerusalem and Egypt. One corner of the principal mosque of Cairo gave way; it was immediately succeeded by two other earthquakes.

464. The earth trembled six times at Bagdad in one earthquake.

478. In Moharrem there was an earthquake at Arjan, under which many Greeks perished.

479. In Irak, in Mesopotamia and in .Syria, many buildings were destroyed by an earthquake.

484. In Syria and elsewhere, many buildings, ninety villages, and the walls of Antiochia were destroyed by an earthquake.

508. In Mesopotamia thirteen villages belonging to Roha were destroyed, and part of the walls of Harran; also in Elsun about 100 houses and one-half of the fortress were destroyed.

511. In the days of Arafat were many houses destroyed at Bagdad.

513. The 5th of Ramadan Kazwin was destroyed by an earthquake which returned the following year precisely at the same time.

515. In the Hejaz.

516. At Jannezah part of its wall sunk.

524. Rabi 1st, at Bagdad, many houses were destroyed.

529. At Bagdad several shocks; it began on Thursday the 11th of Shawal and lasted the whole day, amounting to six shocks until Friday night. On the 17th, three shocks took place from midnight till day-break.

532. An earthquake in Syria, Mesopotamia and Irak; many persons were buried under the ruins.

533. At Jannezah 130,000 persons lost their lives. Jannezah sunk, and the spot was covered with black water for the distance of ten farsangs; also Aleppo suffered eighty shocks in one night. It was felt over all the world, but strongest in Aleppo.

538. On the 14th of Zu-l-ka'de, which fell on a Tuesday, was a great earthquake over all the world.

544. At Bagdad about ten shocks were felt, and a mountain fell near Holwan; the Turkomans suffered greatly.

549. A great fiery wind blew one evening: every body believed that the last day was come; this was succeeded by an earthquake; the water of the Tigris disappeared for a while, but made again its appearance.

550. An earthquake at Bagdad.

552. In Syria, the greater part of Aleppo was destroyed; there suffered also Hamat, Shaizar, Emessa, Hisn al Akrad (the fort of the Kurds,) Laodicea, Antiochia. In Shaizar only one woman and a slave were saved.

In Kafertâb not one individual was saved. In Affania the castle was swallowed up, and many towns of the Franks suffered. The walls of several towns of Syria were destroyed; the children perished in the schools, and no one came to ask for them.

551. And the following year several earthquakes took place in Syria.

551. In the night of Rabi 2nd, was a great earthquake. It was preceded and followed by others. In the night of the 25th, at Aleppo, Hamat, and many other places, there were about forty shocks. It was one of the most tremendous earthquakes. On the 29th of the same month, an earthquake took place towards the end of the day, and continued during the night.

The *first* of *Ramazan* three shocks.

On the *third* of the same month three earthquakes; one at noon, the others at midnight.

In the middle of Ramazan there was an earthquake at night, and another in the morning, and two during the following night, and another shock the subsequent day. In the night of the 23d of Ramazan and in the second of Shawal, new shocks of earthquakes were felt which were more violent than the preceding ones, there were also earthquakes on the 7th, 16th and 17th, and in the night of the 22d.

552. In the night of 19th of Safr, a great earthquake took place which was followed by another shock; a third one took place in the night of the 20th, and the following day in Syria. In the night of the 25th Jomada 1st, four shocks. In the night of the 4th of Jomada 2d, several shocks,

particularly at Aleppo and Emessa, where they were destructive ; also in Hamat, Kafertab, and Taima. In the 4th of Rajeb at day time at Damascus it was so violent, that never the like had been seen ; it caused some destruction. In the night of Friday the 8th of Rajeb there were three earthquakes, which were followed by other earthquakes on Saturday, Sunday and Monday night, and several shocks after that. It did great damage in Hamat, Shiraz, and Emessa. In Damascus it did not begin before Monday the 29th of Rejeb, but caused great consternation. Another earthquake took place on the 24th of Ramazan, which was terribly felt at Aleppo, and Hamat (Apamea,) where it continued for sometime with intermissions. In the night of Saturday the 10th of Shawal and in the night of the 10th of Dilkada, and on the night of the 23d and 25th of the same month, people were so frightened by earthquakes, that they took refuge in the fields. Apamea was destroyed.

565. An earthquake in Syria, Mesopotamia and almost all the world ; it destroyed many walls and houses in Syria, more particularly at Damascus, Emessa, Apamea, Aleppo and Balbek.

574. In Armenia and in the country of Irbil.

575. A great earthquake.

592. Great wind over all the world, and an earthquake in Egypt.

593. A large star was split, and a tremendous noise was caused by it, which made the earth tremble. This took place on Friday the 9th of Jomada 2d.

597. In Shawan, there was an earthquake almost over all the world, more particularly in Upper Egypt, where it caused great destruction ; it extended over Syria and the sea, Mesopotamia, the Greek Empire and Irak ; it was particularly destructive in Syria. It was also felt in Armenia, Azerbijan, and it is calculated that through this earthquake 1,100,000 lives were lost. The first shock lasted but a short time, but after that it continued for several days, and it seems that it came from Mesopotamia to the sea-coast.

578. In Shaban at Emessa, the castle of the Kurds was destroyed ; it extended as far as Nablus.

600. An earthquake in Egypt, Mesopotamia, Syria, Mausil, Irak, the Greek Empire and Cyprus ; it extended as far as Sabta in the Maghrib.

605. An earthquake at Nishapur, which lasted ten days.

608. In Egypt and Cairo many persons lost their lives, and great smoke arose west of Damascus.

623. On Monday, on the new moon of the latter Jomada, a noise was heard about Medina for two days, which was followed by a great earthquake, which caused great destruction.

657. In Egypt.

661. Mausil.

662. In Egypt.

667. In Sus, by which many castles were destroyed and many lives lost.

692. In the month of Safr at Ramla, Fakul and El-Kerk three villages were destroyed.

693. In Egypt.

702. On the 23d Dhilhajj, Thursday, in Egypt and Syria, many persons were buried under the ruins, and all Alexandria was submerged under the sea.

722. In Mohurrum at Damascus at night.

729. In Rajeb, at Tripolis and in Syria.

744. In Egypt and Syria.

741. On the 4th of Ramazan, two shocks in one hour at Cairo.

775. A slight earthquake at Cairo.

787. On the 13th of Shaban, slight earthquake at Cairo and Egypt.

788. The 18th Jomada 2nd, a slight earthquake.

791. Sufr at Nishapur, violent wind and earthquake; many souls lost.

Nishapur was seven times destroyed by earthquakes, but this time was the worst.

Aleppo and its dependencies suffered from earthquakes on Jomada 2nd, and Shawan and Jomada 1st; and besides that several times in the same year.

809. An earthquake in Antiochia, many lives lost.

811. In Shaban about Aleppo and Tripolis, many lives lost by earthquakes

822. At Arzangán ارزنكان and Constantinople.

825. At Cairo.

828. In Shaban, in Egypt, three shocks in one day.

834. In Shaban, at Granada, and in Spain.

838. In Rabi 2d at Cairo.
841. In Shaban at Cairo, a slight earthquake.
861. At Arzangán, the most part of which was destroyed.
863. At Kerk 100 lives lost by an earthquake.
881. In Egypt a slight earthquake at night.
880. 17th of Mohurrum, at noon, a violent earthquake in Egypt.
888. The 9th of Jomada 1st, on Sunday, a slight earthquake.
889. Rabi 1st, six or more terrible shocks at Aleppo.
896. 12th Jomada 2d, on Sunday, a slight earthquake in Egypt.
905. The night of Friday 27th Dilhajj, a slight earthquake.

A general Statement of the Weather at Kotgurh and Soobathoo, for 1819-20-21. *By Captain* PATRICK GERARD.

Clear,	16 days
Fair, but cloudy and partially cloudy,	8 ,,
Rainy and stormy, snow and hail,	7 ,,
Thunder,	none.

Height of the Barometer.

	Inches.	Thermometer.
Maximum,	23.740	45°
Minimum,	23.445	31°
Mean,	23.592	38°

Temperature of the air.		Temperature of the house.	
Maximum,	No.	Maximum,	45°
Minimum only,	23° 1′	Minimum,	31°
Mean,	No.	Mean,	38°

Prevailing wind during the month, westerly, but generally very variable.

A general Statement of the Weather at Kotgurh, for February, 1819.

Clear,	11 days
Fair, but cloudy and partially cloudy,	8 ,,
Rainy and stormy, snow and hail,	9 ,,
Thunder,	1 ,,

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ...	23.810	44° 5′
Minimum, ...	23.535	39° 1′
Mean, ...	28.672	41° 8′

Temperature of the air.		Temperature of the house.	
Maximum, ..	45° 6′	Maximum, ..	47° 8′
Minimum, ..	27° 2′	Minimum, ..	37° 7′
Mean, ..	36° 4′	Mean, ..	2° 7′

Prevailing wind during the month easterly, but variable.

A general Statement of the Weather at Soobathoo, for March 1819.

Clear, ...	18 days.
Fair, but cloudy and partially cloudy, ...	10 ,,
Rainy and stormy, ...	3 ,,
Thunder, ...	3 ,,

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ...	26.110	68°
Minimum, ...	25.640	62° 7′
Mean, ...	25.875	65° 3′

Temperature of the air.		Temperature of the house.	
Maximum, ..	80°	Maximum, ..	73° 5′
Minimum, ..	47°	Minimu,m ..	50°
Mean, ..	63° 5′	Mean, ...	61° 7′

Prevailing wind during the month, south-westerly.

A general Statement of the Weather at Soobathoo, for April 1819.

Clear, ...	15 days.
Fair, but cloudy and partially cloudy, ...	10 ,,
Rainy and stormy, ...	5 ,,
Thunder, ...	4 ,,

Height of the Barometer.

	Inches.	Thermometer.
Maximum,	26.015	76° 2'
Minimum,	25.650	6° 5'
Mean,	25.832	70° 6'

Temperature of the air.		Temperature of the house.	
Maximum,	88°	Maximum,	80° 5'
Minimum,	48°	Minimum,	61°
Mean,	68°	Mean,	70° 7'

Prevailing winds during the month, south-west and south south-west.

A general Statement of the Weather at Kotgurh, for May 1819.

Clear,	12 days.
Fair, but cloudy and partially cloudy,	5 „
Rainy, stormy and hail,	14 „
Thunder,	8 „

No Barometer up.

Temperature of the air.		Temperature of the house.	
Maximum,	No.	Maximum,	69°
Minimum only,	42°	Minimum,	55° 3'
Mean,	No.	Mean,	62° 1'

Prevailing winds during the month, west and south-south-west.

A general Statement of the Weather at Soobathoo, for June 1819.

Clear,	9 days.
Fair, but cloudy and partially cloudy,	11 „
Rainy and stormy,	10 „
Thunder,	8 „

Height of the Barometer.

	Inches.	Thermometer.
Maximum,	25.980	85°
Minimum,	25.640	77° 5'
Mean,	25.810	81° 2'

Temperature of the air.		Temperature of the house.	
Maximum, ..	93°	Maximum, ..	86°
Minimum, ..	65°	Minimum, ..	70°
Mean, ...	79°	Mean, ...	78°

Prevailing winds during the month, west and south-west, and south south-west.

A general Statement of the Weather at Kotgurh, for July 1819.

Clear,	2	days.
Fair, but cloudy and partially cloudy.	10	,,
Rainy and stormy,	19	,,
Thunder,	6	,,

Height of the Barometer.

	Inches.	Thermometer,
Maximum, ...	23.730	73° 9′
Minimum, ...	23.535	68° 1′
Mean, ...	23.632	71°

Temperature of the air.		Temperature of the house.	
Maximum, ..	No.	Maximum, ..	74° 9′
Minimum cnly, ..	55° 9′	Minimum, ..	63° 5′
Mean, ..	No.	Mean, ..	69° 2′

Prevailing winds during the month, east and east south-east.

A general Statement of the Weather at Kotgurh, for August 1819.

Clear,	1	day.
Fair, but cloudy and partially cloudy,	10	,,
Rainy and stormy,	20	,,
Thunder, ..	5	,,

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ...	23.765	72° 9′
Minimum, ...	23.500	66° 5′
Mean, ...	23.632	69° 7′

Temperature of the air.		Temperature of the house.	
Maximum, ..	No.	Maximum, ..	73° 7′

Minimum only,	57° 1′	Minimum,	64° 2′
Mean,	No.	Mean,	68° 9′

Prevailing winds during the month, easterly.

A general Statement of the Weather, for September 1819.

Absent this month on a tour into the interior, but Thermometrical observations were daily taken and recorded at every place during the journey.

Clear,	2	days'
Fair, but cloudy and partially cloudy,	6	,,
Rainy and stormy.	22	,,
Thunder,	4	,,

The prevailing winds during the month, easterly.

A general Statement of the Weather, for October 1819.

Still absent all this month on a tour into the interior.

Clear,	19	days.
Fair, but cloudy and partially cloudy,	6	,,
Rainy and stormy, snow and hail,	6	,,
Thunder,	none.	

Prevailing winds during the month, westerly.

A general Statement of the Weather at Kotgurh, for November 1819.

Clear,	23	days'
Fair, but cloudy and partially, cloudy,	4	,,
Rainy, and stormy and snow,	3	,,
Thunder,	1	,,

Height of the Barometer.

	Inches.	Thermometer.
Maximum,	23.820	50°
Minimum,	23.600	46°
Mean,	23.610	48°

Temperature of the air.		Temperature of the house.	
Maximum,	No.	Maximum,	51°
Minimum,	34°	Minimum,	45°
Mean,	No.	Mean,	48°

Prevailing winds during the month, westerly.

A general Statement of the Weather at Kotgurh, for December 1819.

Clear, ...	11 days.
Fair, but cloudy and partially cloudy.	13 „
Rainy, stormy and snow, ...	7 „
Thunder, ...	1 „

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ...	23.900	48° 5′
Minimum, ...	23.600	43°
Mean, ...	23.750	45° 7′

Temperature of the air.		Temperature of the house.	
Maximum, ..	No.	Maximum, ..	50°
Minimum, ..	30° 5′	Minimum, ..	42° 8′
Mean, ...	No.	Mean, ...	46° 4′

Prevailing winds during the month, easterly.

A general Statement of the Weather, for 1819.

1819.	Clear. days.	Fair, days.	Rainy, stormy, snow and hail days.	Thunder days.
January, ...	16	8	7	none.
February, ...	11	8	9	1
March, ...	18	10	3	3
April, ...	15	10	5	4
May, ...	12	5	14	8
June, ...	9	11	10	8
July, ...	2	10	19	6
August, ...	1	10	20	5
September, ...	2	6	22	4
October, ...	19	6	6	none.
November, ...	23	4	3	1
December, ...	11	13	7	1
Total, ...	139	101	125	41

NOTE.—In the absence of the Maximum Temperature of the air for some of the months, the Mean Temperature of the house will nearly come to the same result as if the Maximum Temperature of the air had been ascertained and recorded. Indeed in the course of many years' observations, the difference between the Mean Temperature of the air and that of the house, if any thing, is so trifling, that it is hardly deserving of notice.

A general Statement of the Weather at Kotgurh, for January, 1820.

Clear,	26 days.
Fair, but cloudy and partially cloudy,	3 ,,
Rainy and stormy,	2 ,,
Thunder,	2 ,,

Height of the Barometer.

	Inches.	Thermometer.
Maximum,	23·720	42°
Minimum,	23·570	41°
Mean,	23·645	41° 5′

Temperature of the air.		Temperature of the house.	
Maximum,	No.	Maximum,	34°
Minimum, only	30° 5′	Minimum,	36°
Mean,	No.	Mean,	39° 5′

Prevailing winds during the month, east, south-east and north-east.

A general Statement of the Weather at Kotgurh, for February, 1820.

Clear,	14 days.
Fair, but cloudy and partially cloudy,	6 ,,
Rainy and stormy, snow and hail,	9 ,,
Thunder,	2 ,,

Height of the Barometer.

	Inches.	Thermometer.
Maximum,	23·760	48°
Minimum,	23·400	42° 8′
Mean,	23·580	45° 4′

Temperature of the air.		Temperature of the house.	
Maximum,	No.	Maximum,	48° 2′
Minimum, only	27°	Minimum,	40°
Mean,	No.	Mean,	44° 1′

Prevailing wind during the month, westerly.

A general Statement of the Weather at Kotgurh, for March 1820.

Clear,	16 days.
Fair, but cloudy and partially cloudy,	6 ,,

Rainy and stormy, snow and hail, ...	9 ,,
Thunder, ...	4 ,,

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ...	23·860	54°
Minimum, ...	23·600	46°
Mean, ...	23·730	50°

Temperature of the air.		Temperature of the house,	
Maximum, ..	No.	Maximum, ..	54° 6′
Minimum, only ..	37° 5′	Minimum, ..	46°
Mean, ..	No.	Mean, ..	50° 3′

Prevailing winds during the month, westerly.

A general Statement of the Weather at Kotgurh for April 1820.

Absent all this month on a tour through the protected hill states, situate between the rivers Sutluj and Jumna, on the hither or Indian side of the Himalaya range, but observations were daily taken and recorded during the journey.

Clear, ...	13 days.
Fair, but cloudy and partially cloudy, . ..	4 ,,
Rainy, stormy and hail, ...	13 ,,
Thunder, ...	6 ,,

Prevailing winds during the month, westerly.

A general Statement of the Weather at Kotgurh for May, 1820.

Clear	13 days.
Fair, but cloudy and partially cloudy, ...	8 ,,
Rainy, stormy, and hail, ...	10 ,,
Thunder, ...	8 ,,

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ...	23·800	64°
Minimum, ...	23·520	65° 9′
Mean, ...	23·660	64° 9′

Temperature of the air.		Temperature of the house.	
Maximum, ..	No.	Maximum, ..	73° 4′
Minimum, only	45°	Minimum, ..	58°
Mean, ..	No.	Mean, ..	65° 7′

Prevailing winds during the month, westerly.

A general Statement of the Weather at Kotgurh, for June 1820.

Clear, ...	7 days.
Fair, but cloudy and partially cloudy	9 „
Rainy, stormy and hail, ...	14 „
Thunder, ...	6 „

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ...	23·700	75° 4′
Minimum, ...	23·440	67° 8′
Mean, ...	23·570	71° 6′

Temperature of the air.		Temperature of the house.	
Maximum, ..	87° 4′	Maximum, ..	77° 1′
Minimum, ..	54°	Minimum, ..	63°
Mean, ..	70° 7′	Mean, ..	70°

Prevailing winds during the month, partly westerly and partly easterly.

A general Statement of the Weather at Kotgurh, for July 1820.

Clear, ...	none.
Fair, but cloudy and partially cloudy, ...	3 days.
Rainy and stormy, ...	28 „
Thunder, ...	2 „

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ...	23·730	70° 6′
Minimum, ...	23·440	65°
Mean, ...	23·585.	67° 8′

Temperature of the air.		Temperature of the house.	
Maximum, ..	81° 8′	Maximum, ..	76°
Minimum, ..	57° 7′	Minimum, ..	64° 4′
Mean, ..	69° 7′	Mean	70° 2′

Prevailing winds during the month, easterly.

A general Statement of the Weather at Kotgurh, for August 1820.

Clear, ...	none.
Fair, but cloudy and partially cloudy, ...	8 days.
Rainy and stormy, ...	23 „
Thunder, ...	2 „

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ...	23·710	69° 7′
Minimum, ...	23·515	69°
Mean, ...	23·612	69° 3′

Temperature of the air.		Temperature of the house.	
Maximum, ..	77° 8′	Maximum, ..	74°
Minimum, ...	56° 5′	Minimum, ..	64° 6′
Mean, ..	67° 1′	Mean, ..	69° 3′

Prevailing winds during the month, easterly,

A general Statement of the Weather at Kotgurh, for September 1820.

Clear, ...	5 days.
Fair, but cloudy and partially cloudy, ...	11 „
Rainy and stormy, ...	14 „
Thunder, ...	2 „

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ...	23·705	69° 4′
Minimum, ...	23·505	67°
Mean, ...	23·605	68° 2′

Temperature of the air.		Temperature of the house.	
Maximum, ..	73° 7′	Maximum, ..	75° 9′
Minimum, ..	60° 7′	Minimum, ..	52° 8′
Mean, ..	67° 2′	Mean, ..	64° 3′

Prevailing winds during the month, easterly.

A general Statement of the Weather at Kotgurh, for October 1820.

Clear, ..	20 days.
Fair, but cloudy and partially cloudy, ..	5 „
Rainy and stormy, ..	6 „
Thunder, ..	3 „

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ..	23·835	58°
Minimum, ..	23·535	62° 4′
Mean, ..	23·685	60° 2′

Temperature of the air.		Temperature of the house.	
Maximum, ...	71°	Maximum, ..	68° 2′
Minimum, ..	43° 8′	Minimum, ..	52°
Mean ..	57° 4′	Mean, ..	60° 1′

Prevailing winds during the month, easterly and westerly.

A general Statement of the Weather at Rampoor, for November 1820.

No Barometer with me.

Clear, ..	18 days.
Fair, but cloudy and partially cloudy, ..	7 „
Rainy and stormy, ..	5 „
Thunder, ..	1 „

Temperature of the air.		Temperature in a tent.	
Maximum, ..	78° 4′	Maximum, ..	79°
Minimum, ..	37° 6,	Minimum, ..	54°
Mean, ..	58°	Mean, ..	66° 5′

Prevailing winds during the month at this place, south-west and south south-west.

A general Statement of the Weather, at Rampoor for December 1820.

Clear, ...	17 days.
Fair, but cloudy and partially cloudy, ...	10 „
Rainy, stormy and snow, ...	4 „
Thunder, ...	none.

Temperature of the air.		Temperature in a tent.	
Maximum, ..	72° 7′	Maximum, ..	No.
Minimum, ..	32° 7′	Minimum, only	39°
Mean, ...	52° 7′	Mean, ..	No.

Prevailing winds during the month at this place, south-west and south south-west.

A general Statement of the Weather for 1820.

1820.	Clear days.	Fair days.	Rainy and stormy, snow and hail days.	Thunder days.
January, ...	26	3	2	2
February, ...	14	6	9	2
March, ...	16	6	9	4
April, ...	13	4	13	6
May, ...	13	8	10	8
June, ...	7	9	14	6
July	none	3	28	2
August, ...	ditto	8	23	2
September, ...	5	11	14	2
October, ...	20	5	6	3
November, ...	18	7	5	1
December, ...	17	10	4	none
Total, ...	149	80	137	38

Note.—Having been obliged to proceed to and remain at this place on duty, it may be as well to mention, that Rampoor is a small town and the capital of Bussahir, about 22 miles beyond the military outpost of Kotgurh, situate on the left bank of the Sutlej, and the winter residence of the Rajah of that state. It is in latitude 31° 27′ and longitude 77° 38′ and its elevation above the level of the sea by Barometrical observation is 3,398 feet.

A general Statement of the Weather at Kotgurh, for January 1821.

No Barometer up.

Clear,	11 days.
Fair, but cloudy and partially cloudy,	12 ,,
Rainy, stormy, snow and hail,	8 ,,
Thunder,	none.

Temperature of the air.		Temperature of the house.	
Maximum,	52° 2′	Maximum,	47° 8′
Minimum,	28° 4′	Minimum,	36° 8′
Mean,	40° 3′	Mean,	42° 3′

Prevailing winds during the month, westerly.

A general Statement of the Weather at Kotgurh, for February 1821.

Clear,	11 days.
Fair, but cloudy and partially cloudy,	14 ,,
Rainy, stormy and hail,	3 ,,
Thunder,	2 ,,

Temperature of the air.		Temperature of the house.	
Maximum,	68° 7′	Maximum,	59°
Minimum,	29°	Minimum,	37°
Mean,	48° 8′	Mean,	48°

Prevailing winds during the month, partly west and partly east.

A general Statement of the Weather at Soobathoo, for March 1821.

Clear,	18 days.
Fair, but cloudy and partially cloudy,	5 ,,
Rainy, stormy and hail,	8 ,,
Thunder,	4 ,,

Height of the Barometer.

	Inches.	Thermometer.
Maximum,	26·105.	71° 3′
Minimum,	25·780.	59° 8′
Mean,	25·942.	65° 5′

Temperature of the air.		Temperature of the house.	
Maximum, ..	78° 5′	Maximum, ..	73°
Minimum, ..	48° 3′	Minimum, ..	56°
Mean, ..	63° 4′	Mean, ..	64° 5′

Prevailing wind during the month, westerly.

A general Statement of the Weather at Soobathoo, for April 1821.

Clear, ...	18	days.
Fair, but cloudy and partially cloudy, ...	9	,,
Rainy, stormy and hail, ...	3	,,
Thunder, ...	4	,,

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ...	26·200.	73°
Minimum, ...	25·850·	67° 8′
Mean, ...	26·025·	70° 4′

Temperature of the air.		Temperature of the house.	
Maximum, ..	87° 4′	Maximum, ..	81° 4′
Minimum, ..	54° 5′	Minimum, ..	64° 8′
Mean, ..	70° 9′	Mean, ..	73° 1′

Prevailing winds during the month, west and south-west.

A general Statement of the Weather at Kotgurh, for May 1821.

Clear, ...	15	days.
Fair, but cloudy and partially cloudy, ...	6	,,
Rainy, stormy and hail, ...	10	,,
Thunder, ...	10	,,

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ...	23·670.	82° 7′
Minimum, ...	23·530.	64° 5′
Mean, ...	23·600.	73° 6′

Temperature of the air.		Temperature of the house.	
Maximum,	85°	Maximum,	82° 7′
Minimum,	50° 2′	Minimum,	63° 6′
Mean,	67° 6′	Mean,	73° 1′

Prevailing winds during the month, westerly.

A general Statement of the Weather at Kotgurh, for June 1821.

Clear,	18 days
Fair, but cloudy and partially cloudy,	4 ,,
Rainy and stormy,	8 ,,
Thunder,	5 ,,

Height of the Barometer.

	Inches.	Thermometer.
Maximum,	23·795.	75°
Minimum,	23·480.	72° 3′
Mean,	23·637.	73° 6′

Temperature of the air.		Temperature of the house.	
Maximum,	88° 4′	Maximum,	81° 3′
Minimum,	56°	Minimum,	65° 4′
Mean,	72° 2′	Mean,	73° 3′

Prevailing wind during the month, westerly.

A general Statement of the Weather at Kotgurh, for July 1821.

Clear,	none.
Fair, but cloudy and partially cloudy,	10 days.
Rainy and stormy,	21 ,,
Thunder,	5 ,,

Height of the Barometer.

	Inches.	Thermometer.
Maximum,	23·760.	73° 7′
Minimum,	23·470.	70°
Mean,	23·615.	71° 8′

Temperature of the air.		Temperature of the house.	
Maximum, ..	85° 3′	Maximum, ..	81° 5′
Minimum, ..	59° 4′	Minimum, ..	66°
Mean, ..	72° 3′	Mean, ..	73° 7′

Prevailing winds during the month, west and east-north-east.

A general Statement of the Weather at Kotgurh, for August 1821.

Clear, ...	none.
Fair, but cloudy and partially cloudy, ...	12 ,,
Rainy and stormy, ...	19 ,,
Thunder, ...	2 ,,

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ...	23·695.	73°
Minimum, ...	23·530.	66° 2′
Mean, ...	23·612.	69° 6′

Temperature of the air.		Temperature of the house.	
Maximum, ..	75°	Maximum, ..	75° 1′
Minimum, ..	58°	Minimum, ..	62°
Mean, ..	66° 6′	Mean, ..	68° 5′

Prevailing winds during the month, north-east and east-north-east.

A general Statement of the Weather at Kotgurh, for September 1821.

Clear, ...	6 days.
Fair, but cloudy and partially cloudy, ...	8 ,,
Rainy and stormy, ...	16 ,,
Thunder, ...	3 ,,

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ...	23·875.	69° 6′
Minimum, ...	23·680.	59° 6′
Mean, ...	23·777.	64° 6′

Temperature of the air.		Temperature of the house.	
Maximum,	76° 3′	Maximum,	75° 5′
Minimum,	48° 7′	Minimum,	48° 5′
Mean,	62° 5′	Mean,	62°

Prevailing winds during the month, west and east-north-east.

A general Statement of the Weather at Kotgurh, for October 1821.

Clear,	25 days.
Fair, but cloudy and partially cloudy,	1 ,,
Rainy and stormy,	5 ,,
Thunder,	1 ,,

Height of the Barometer.

	Inches.	Thermometer
Maximum,	23·930.	63°
Minimum,	23·650.	55°
Mean,	23·790.	59°

Temperature of the air.		Temperature of the house.	
Maximum,	67°	Maximum,	66° 7′
Minimum,	41° 4′	Minimum,	51°
Mean,	54° 2′	Mean,	58° 8′

Prevailing winds during the month, west and east-north-east.

A general Statement of the Weather at Kotgurh, for November 1821.

Clear,	19 days.
Fair, but cloudy and partially cloudy,	9 ,,
Rainy and stormy,	2 ,,
Thunder,	none.

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ...	23·860.	58° 6′
Minimum, ...	23·600.	49°
Mean, ...	23·730.	53° 8′

Temperature of the air.		Temperature of the house.	
Maximum, ..	59° 8′	Maximum, ..	59°
Minimum, ..	42°	Minimum, ..	48° 3′
Mean, ..	50° 9′	Mean, ..	53° 6′

Prevailing winds during the month, west and south-west.

A general Statement of the Weather at Soobathoo, for December 1821.

Clear, ...	14 days.
Fair, but cloudy and partially cloudy, ...	12 „
Rainy and stormy, snow and hail, ...	5 „
Thunder, ...	1 „

Height of the Barometer.

	Inches.	Thermometer.
Maximum, ...	26·100.	59° 6′
Minimum, ...	25·900.	52°
Mean, ...	26·000.	55° 8′

Temperature of the air.		Temperature of the house.	
Maximum, ..	66°	Maximum, ..	59° 6′
Minimum, ..	39° 5′	Minimum, ..	49°
Mean, ..	52° 7′	Mean, ..	54° 3′

Prevailing winds during the month, west and south-west.

A general Statement of the Weather, for 1821.

1821.	Clear days.	Fair days.	Rainy and stormy, snow and hail days.	Thunder days.
January, ...	11	12	8	none.
February, ...	11	14	3	
March, ...	18	5	8	
April, ...	18	9	3	
May, ...	15	6	10	
June, ...	18	4	8	
July, ...	none.	10	21	
August, ...	none.	12	19	
September, ...	6	8	16	
October, ...	25	1	5	2
November, ...	19	9	2	none.
December, ...	14	12	5	1
Total, ...	155	102	108	38

Note.—It appears necessary here to remark, that during the years 1819-20 and 21, Simla was no place of resort for invalids and visitors, except for few officers belonging to the 1st Nusseeree Battalion stationed at Soobathoo, and thither they proceeded for the hottest months, May and June, till the rains had fairly set in. In 1819, a double-poled tent was pitched by Lieutenant, now Lieutenant Colonel R. Ross, on the north-west extremity of the ridge, immediately above the small village of Simla, and afterwards thatched over, having for its walls, spars, grass and mud as a protection from the weather, and being on the site of the Commander-in-Chief (Sir H. Fane's,) now Major General Lumley's house. In 1822, the first permanant cottage, of the usual materials, stone and timber, roofed with pine wood shingles, was erected on a rising ground on a small height on the same ridge by Captain, now Major C. P. Kennedy, the successor of Lieutenant R. Ross, as Assistant Political Agent for the Protected Hill States, and although the out-post of Kotgurh is 650 or 700 feet lower in elevation than Simla, being four long marches beyond it, and further into the interior, and not subject to the influence of the plains, which Simla is in a more or less degree, yet the temperature at Kotgurh for the above years will give a very fair notion of that which may be generally experienced at Simla, as in subsequent years, on comparison, the average temperature of the former place, proved only to be a trifle lower than that observed and recorded at the latter.

P. GERARD.

Meteorological Register kept at Kathmandoo, Valley of Nepal. By Captain G. H. ROBINSON, *for the month of March* 1834.

March 1831.	Thermometer inside.				Thermometer outside.				Barometer with Ther. attached.				Range of		Range of Thermometer inside.	Range of Thermometer outside.	Rain.	
	8	10	2	4	8	10	2	4	8	10	2	4	Bar.	Ther. attached.				
1	62	58	63	63	48	...	...	...	25.012	25.007	24.997	24.997	.008	9	5	...	...	
2	...	...	...	...	...	...	...	...	...	...	...	... ...	...	...	...	...	...	
3	61	60	61.5	62	45	61	68	65	25.024	25.014	25.011	25 006	.012	10	2	23	...	
4	62	58	62	62	42	58	70	68	25.031	25 027	25.023	25.006=65	.014	11	4	28	...	
5	62	58	62	63.5	44	60	71.5	71	25.044	25.42	25.019	25.41	.033	12	4.5	27.5	...	
6	62	59.5	...	63.5	47.5	62	...	71	2 .245	25.239	25.243	25,238	.019	8	4.5	23.5	...	
7	60	60	...	62	47	66	...	72	25.209	25.208	...	25.197	.016	10	2	25	...	
8	62	...	...	...	50	...	...	...	25.205	25.	...	... ...	...	...	...	...	...	
9	64	...	...	66	...	...	...	...	25.193	25.168	...	25 166	.010	11	2	...	...	
10	64	63	...	64	52	...	...	...	25.160	25.077	...	25 60	.082	7	1	...	...	
11	62	6	...	62	...	...	...	...	25 057	...	...	25.044	...	...	...	...	...	
12	62	...	...	64	49	...	...	66	25.071	25.053	...	25.042	.007	10	2	17	...	
13	62	61	63.5	...	48	58	63.5	...	25.037	25.051	25.041	... ...	.007	9	2.5	15.5	...	
14	63	61	63	...	49	56	...	...	25.047	25.052	25 044	... ...	.010	5	2	...	...	
15	62	...	...	...	52	...	...	...	25.064	25.	...	... ...	...	...	...	...	...	
16	62	62	63	...	50	58	66	...	25.061	25.051	25.046	... ...	.007	4	...	16	...	
17	62	60	63	64	50	56	68	67	25.055	25.052	25.053	25.036	.016	8	4	18	.346	
18	60	59	61.5	...	45 5	...	...	...	25.057	25.050	25.044	... ...	.010	8	2.5	...	...	
19	60	59	61	62	47	59	70	69	25.070	25.082	25.084	25.077	.040	11	3	23	...	
20	58	58	...	64	45	60	...	72	25.097	25.092	...	25.084	.014	11	6	27	...	
21	60	59.5	64	64	46	61.5	74	74	25.102	25 096	25.088	25.081	.009	10	4.5	2.8	...	
22	62	64	63.5	...	49.5	64.5	75.5	...	25.111	25.105	25.095	25.093	.009	11	2	26	...	
23	...	62	64	65	...	65	74	72	25.213	25.069	25.267	25.267	.074	8	3	...	...	
24	63.5	62	64.5	65	51	65	73	...	25.256	25 (6)	25.248	25.246	.012	8	3	22	...	
25	63	62	64	...	54	66	70	...	25.254	25.250	25.239	25.241	.007	8	2	16	.032	
26	...	64	66	66	...	70	73	68	...	55.236	25 215	25.251	.080	3	2	...	...	
27	64	64	66	...	60	71	79.5	...	25.249	25.142	25.133	25.	.002	6	2	19 5	...	
28	64	64	66.5	...	60	64	76	...	25.123	25.126	25.84	5.183=8 P.M.	.030	6	2.5	16	.299	
29	64	66	70	70	66	72	78	80	25 088	25 029	25.77	25.069	.007	7.5	6	14	...	
30	68	66	66.5	...	61	67.7	...	...	25.091	25.085	25.86	25.79	.007	3	...	...	...	Rain 3 days.
31	66	65	68	68	58	68	78	70	25.098	25.083	25.78	25.078	.000	8	3	12	...	
																	.677	

Supplementary Note to Mr. Commissioner LUSHINGTON'S *Report on the Copper Mines of Kemaon and Ghurwal, Journal, p.* 472.

Since the above report was submitted to Government in 1841, I have had the pleasure of meeting and forming the acquaintance of Captain Drummond, (late one of the Cabool hostages,) to whom allusion is made in the first part of the report, as having suggested the experimental working of the Pokree mine. Captain Drummond's opinion is, I believe, still favourable to further experiments being made in the Kemaon and Ghurwal mines under European superintendence, and as he has seen and examined all the papers connected with Mr. Wilkin's operations, and knows much more of these matters than I can pretend to do, his opinion is likely to be more correct than mine.

As connected with Mr. Wilkin, there is one important omission in my report, which in justice to him I would wish to supply. I allude to his uniformly kind and conciliating treatment of the Natives, and to the fact of my never having had a single complaint preferred to me by any of them, in the least affecting his character, from the time of his location at Pokree to the date of his departure from the province.

Almora, 29th August, 1843. G. S. LUSHINGTON.

Note on a Fossil Antelope, from the Dadoopoor Museum. By Capt. W. E. BAKER, *Bengal Engineers.*

We have had great pleasure in doing full justice, as far as our humble efforts could do so, to this highly interesting notice, in procuring the aid of the best artist in Calcutta, who, our readers may be assured, has given a most exact *fac simile* of Captain Baker's capital pen and ink drawing.—EDS.

Among the notices of the Sub-Himalayan fossils which have from time to time appeared in the Journal of the Asiatic Society, but few have been devoted to the remains of Ruminantia. The Sivatherium indeed was one of the first described, and the Camelidæ subsequently formed the subject of a paper by Capt. Cautley and Dr. Falconer; but the various species of Bos, Cervus, Antelope, &c. which occur in this deposit more frequently perhaps than any other, have hitherto passed unnoticed.

To supply this deficiency, however, is not my present purpose. I have neither leisure, nor a sufficiently extensive museum of comparative Osteology, to attempt the description, or even the classification of our fossil Ruminants; but it appeared to me to be a circumstance deserving the attention of other enquirers, that there is a strong resemblance between the skulls of some of our Antelopes, and those figured in Capt. Harris's splendid work, "Portraits of Game and Wild Animals in Southern Africa."

The degree of resemblance will be judged from the accompanying plate, in which Fig. 1 and 2, represent a front and side view of one of the fossils above alluded to, about one-fourth the natural size. The face of this fossil is tolerably perfect, excepting the extremities of the intermaxillary bones, but the occipital portion of the head and the tips of the horns are wanting.

Fig. 3 and 4 are similar views of the skull of an Indian Antelope, (A. cervicapra,) drawn on the same scale.

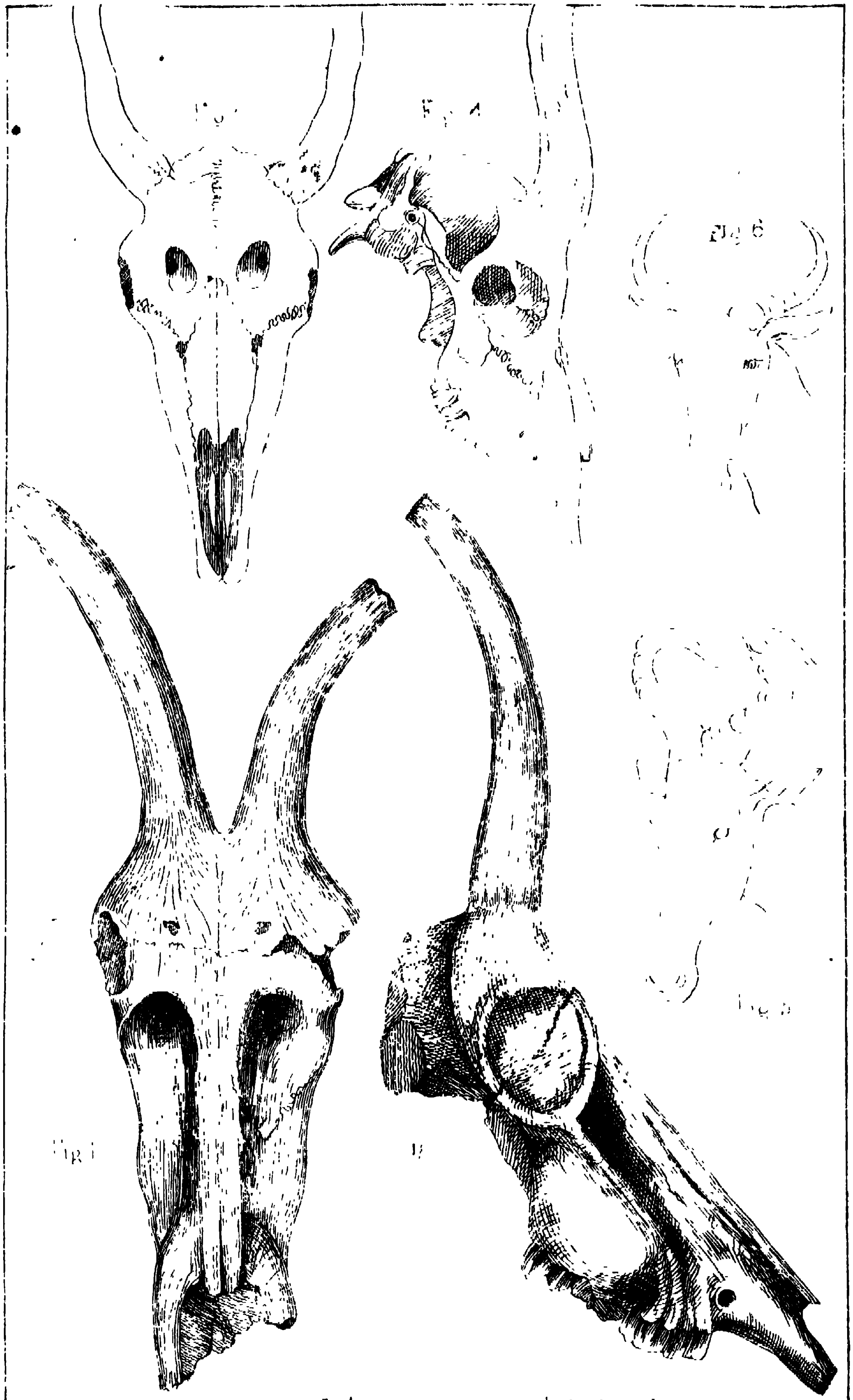
Fig. 5 and 6 are outlines of the heads respectively of the Hartebeest, (Acronotus Caama,) and the "Sassaybe," (Acronotus lunata,) copied from Capt. Harris's plate.

The fossil differs from the Indian Antelope, in the greater elongation of its face, the straightness of its profile, the close juxta-position of its horns at the base; the absence or small development of the infra-orbital sinus, and the small size of the supra-orbital foramina. In all these respects it resembles one or other of the African genera, from the descriptions of which, by Capt. Harris, I have extracted the following:—

Acronotus Caama or Hartebeest. "Head remarkably heavy, narrow and long. Horns seated upon the summit of a beetling ridge above the frontals; very close together, and almost touching at the base. No suborbital sinus, but a constant mucous discharge of a waxy nature."

Acronotus Lunata, or Sassaybe. "Head long, narrow and shapeless; wearing a bubaline appearance, facial line straight. Eyes high in the cranium, indistinct lachrymary perforation."

As far therefore as can be judged from a description which, like the above, has no particular reference to the Osteology of these animals,



Fossil Antelope from the Sub Himalayas

they appear to have a considerable resemblance to our fossil. It would be highly interesting, should they be hereafter identified, and should it thus appear that the groups of grotesque Ruminants now apparently confined to the Prairies of Africa, had once a wider distribution. The assemblage in one deposit of animals differing so widely in their forms and habits, and in their adaptations to particular localities, leads irresistibly to the conclusion, that we have before us the delta of a large river, which, in one of the past configurations of our globe, must have collected in its course the various spoils of some extensive continent. No existing river, excepting perhaps the Nile, could unite in one vast cemetery the remains of every known order of terrestrial Mammalia and aquatic reptiles; of the denizens of the forest, the lake and the mud bank, mingled with those of the wide prairie and the sandy desert.

A Ninth Memoir on the LAW OF STORMS IN INDIA; *being the Pooree and Cuttack Storms of 2nd, and the Gya and Patna Storms of 5th and 6th October,* 1842. *By* HENRY PIDDINGTON.

I had at first intended to include these storms in my preceding Memoir as a second part, but as, when a storm or storms in different parts of the ocean or on shore can be tolerably well traced, there may be some advantage, particularly when the tracks approach the Sandheads, in keeping the documents apart in different Memoirs and tracing them upon a separate chart. I have preferred doing so in this instance, and I have published the Madras storm first, forming the Eighth Memoir, as being of the two that which was of the highest interest, though the present are of a prior date.

On the 2nd October, the coast about Pooree and Cuttack was visited by a severe storm, which was felt as a gale at the Sandheads to the north, and to about lat. 17½ to the southward. In some parts of its progress it appears to have been excessively severe, and two large ships, at least the *Acasta** and *Imaum Shah,* if not more, foundered within these limits; besides many coasting vessels.

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* By an advertisement in the papers it would appear, that a ship of about 300 tons had sunk in eighteen feet water off Juggernath Pagoda about the time of this storm, which was supposed to be the *Acasta* from Madras.

At Calcutta, being at the time very unwell, I could not register any observation; but those of the Surveyor General's Office are given in their place. It will be seen from the documents and charts, that these storms are a remarkable instance either of two separate storms of small extent coming up together, or, which I am inclined to suppose, a large storm dividing itself into two small ones, and travelling up with great rapidity towards the coast. The grounds for these views will be as usual shewn in the summary which follows the documents and comparative table. The storms at sea were followed on the 5th and 6th of October, by severe inland storms from Gya to Patna, extending to Benares and other places; but having scarcely any documents from the stations between Cuttack and Gya, we cannot say with any certainty, that the two sets of storms were connected.

Abridged Log of the Ship Essex, Captain W. H. Brown, *from Madras to Calcutta, Civil time. Barometer corrected to that at the Surveyor General's Office. From the Marine Board.*

The *Essex* left Madras on the 29th September 1842, and reached lat. (by account) 16°, long. 83° 50′ E. by noon on 1st October, having had variable winds.

P. M. Cloudy; 6, squally with rain, much lightning to N. W.; 8, squally, very vivid lightning from N. W. to N. E. Dense black clouds to northward; 9, wind W. N. W. wind increasing and cross sea rising; 10, increasing; midnight hard squalls with high sea from N. N. E. Barometer falling, double-reefed the topsails, high confused sea running from N. W., N. W. and N. E. very heavy rain.—8 P. M. Bar. 29.836. Ther. 82.—10 ditto, Bar. 29.766. Ther. 81—Midnight, Bar. 29.586. Ther. 80.

Sunday, 2nd October.—Gale increasing, very heavy rain and hard squalls, sea very high and confused, wind veering suddenly from S. W. to N. W. and back again; 6-30, a very vivid flash of lightning and sudden awful crash of thunder burst immediately over the mast heads making the ship tremble; very hard squalls 7-30. At 7 A. M. Bar. 29.436. Ther. 81.—9 ditto, Bar. 30,29.406, Ther. 82.—Noon, Bar. 29.406. Ther. 84.—2 P. M. Bar. 29.436, Ther. 83.

Rain falling in torrents; 9-30, furled the fore top sail and hove the ship to, with head to N. N. Westward, wind then settled at West. Noon no rise in the mercury, secured every thing, and made snug for bad weather. Latitude account 17° 10′ N., longitude 85° 30′ E.; P. M. squalls very heavy, but clouds more broken. It had previously been very thick and very oppressive, wind W. N. W. At 2, the mercury which had been stationary since 10 A. M. began to rise. At 5 P. M. moderating, squalls less severe, and not continually raining as it had previously done; made a little sail and bore up to the E. N. Eastward, wind settled at W. S. W. clearing up. Night fine and starlight, with passing light squalls, made all sail, sea going down fast.—8 P. M. Bar. 29.836, midnight 29.336.

Monday.—Fine weather; Noon latitude 19° 10′ N., longitude 89° 25′.—Barometer 29.886.

Extract from the Log of the French Ship Lion, Captain E. BONNET. *Reduced to civil time.*

The *Lion* left Karical on the evening of the 30th September, passed in sight of Pondicherry, and at noon 1st October was in lat. 13° 0′ N., long. 19° 21′ E. of Paris, (80° 41′ Greenwich.) P. M. and to midnight cloudy, an 8 knot breeze from W. N. W.

2nd October.—Weather and sea increasing, steering 9 knots per hour to N. E. with winds from S. W. to W. S. W. Noon latitude 15° 9′ N., longitude 83° 01′. P. M. (85° 21′ Greenwich.) P. M. bad appearances, shortened sail at midnight; going 7 knots to N. E., wind S. W., less sea and wind.

3rd October.—Wind to noon S. S. W. At noon fine weather, very heavy sea, latitude 17° 20½′, longitude E., Paris 85° 21′ (87° 41′ Greenwich). From noon 2nd, a current of 90′ to the Eastward.* P. M. fine weather to midnight; out reefs.

4th October.—A. M. squally but fine, a good deal of sea. At ½ past 9, saw a ship which we passed at 10; she had lost her foremast, but made no signals; stood on. Noon latitude 20° 23′ N., sounding 80 fathoms, mud.

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* This is worth remarking, as probably the effect of the storm wave.

Dr.* Cumberland, *the Civil Surgeon of Pooree, has kindly obliged me with the following very clear account of this Storm, as experienced at that station:—

We have lately had a very severe gale at Pooree, the particulars of which I subjoin. The gale commenced on the night of the 1st instant, blowing hard from North, with rain. It continued to increase during the 2nd, occasionally blowing in very heavy gusts, with rain from North. At 6 P. M. the wind which had blown from due N. shifted to E. N. E. when there was an abatement in the violence of the storm. At 6½ P. M. it re-commenced with renewed violence, accompanied with thunder and lightning. At 8 P. M. blowing very heavily from S. E. At 9 P. M. more moderate, heavy rain. At 10 P. M. furious gusts from S. S. E. At 11½ P. M. more moderate. At 12½, heavy gusts from South, thunder and lightning, then again more moderate. At 1½ A. M. of the 3rd, violent gusts from S. after which the gale abated, leaving a brisk gale from South, and towards evening S. S. W., gradually diminishing. The 4th was fine with fresh S. W. breezes. The height of the thermometer on the 2nd was 78°, lowest 76°. Quantity of rain from 8 A. M. of the 2nd to 8 A. M. of the 3rd, 5 inches and ten-tenths. The damage occasioned by this gale both at sea and in shore is immense; no less than six coasting vessels were wrecked within a few miles of Pooree, and the "*Imaum Shah,*" 700 tons burthen, foundered off the coast, only four hands saved out of 100 on board. The Nacoda told me that he was at anchor somewhere about the Sandheads when the gale commenced from the Westward; however there is no reliance to be placed on that. The poor man lost his wife and family, and I dare say was somewhat bewildered. The town of Pooree presents a sad scene of devastation, and a great many people have been killed. To give you an idea of the violence of the storm I may mention, that it was about one-eighth more violent than that of April 1840, an account of which both the late Mr. Ewart and myself forwarded to you.* I have had letters from Cuttack to-day, dated the 4th. There I am informed on the 2nd, they had a smart storm, only a few trees blown down, but no material injury done. Cuttack is 50 miles north of Pooree, so that it appears to have confined its ravages more to the coast.

R. B. Cumberland,
Civil Assistant Surgeon.

Pooree, 5th October, 1842.

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* See Jour. As. Soc. Vol. ix, p. 1021. Third Memoir on Law of Storms in India.

Dr. Minto, *Civil Assistant Surgeon at Cuttack, obligingly sends me the following account of the gale as experienced there* :—

Being unable to take particular notes of the weather during the last few days I applied to a friend to favor me with his, and as they may be useful to you, I transmit a copy.

1*st October.*—First part heavy rain; noon N. N. E. and N. E. *strong* breeze; 8 P. M. increasing breeze North, fresh gale and heavy squalls of rain.

2*nd.*—First part North, fresh gale and heavy squalls from North, N. N. E. and N. E. noon increasing gale, North and N. N. E.; 4 P. M. strong gale North, furious squalls from N. and N. E.; midnight a rasping gale N. and N. N. E; heavy rain.

3 A. M. a lull; 6 A. M. a strong breeze from E. S. E. and S. E.; increasing breeze and cloudy; latter part moderate breeze and cloudy.

I should say the strength of the gale, which came with heavy squalls of rain, was from noon until sun-set of the 2nd. From the evening of the 1st until day-light of the 3rd, three inches of rain fell. There has little injury been done to property, considering the severity of the weather, I mean in the immediate neighbourhood of Cuttack.

A. Minto,
Assistant Civil Surgeon.

Englishman, 25th October, 1842.

ARRIVAL.

25*th October.*—Ship *Juddah Rohoman,* Nacoda, from Muscat 30th August.

REMARKS.

The *Juddah Rohoman* driven out from the Sandheads on the 30th September in a severe gale of wind from the Eastward, lost fore and main-masts by the board, and was obliged to throw a quantity of cargo overboard, to lighten the ship. On the 2nd of October in company with a large ship of 600 tons with nothing left but her bowsprit, she made various signals, but we could not understand them, in one hour afterwards no trace of her could be seen, supposed her to have foundered, it blowing hard at the time and a tremendous sea running; this took place in latitude 19° 11′ N., longitude 87° 58′ E.

The Ship Eliza was outward bound, and put to sea from the Sandheads at the commencement of the storm. Captain McCarthy has obligingly communicated the following graphic account of it to me through Messrs. Cockerell and Co., of which I have only abridged those manœuvres and preparations which every seaman understands to be matter of course, which would not be intelligible to other readers, and which do not serve to throw any light upon our subject.

Report of Capt. McCARTHY, *Ship Eliza, civil time.*

30th September, 1842.—Civil time A. M. Light breeze from the southward and fine weather; at 3 A. M. hove up and made all sail down from Saugor Point, set all studding sails; at noon light winds from N. N. E. to N. N. W. and fine weather. Barometer 29.80. Thermometer 84.0. Steering down Channel, a very heavy rolling hollow swell and all possible sail set. The heavy head swell continued all the way down Channel. At 2 hours 50 minutes, Mr. Hand, Pilot, left the ship about two miles above the outer Floating Light, and went up in the steamer. Increasing breezes and cloudy, *a strong Westerly set,*[*] steering S. S. E. ½ E.; at 7 P. M. the Light Vessel North, wind from N. N. E. to N. N. W., a heavy dark appearance from the S. E.; from sunset to 9 P. M. light winds from Northward with much, very vivid, lightning to the S. E., threatening appearance and incessant lightning; at 11 Barometer 29.78. Smart squall from S. E. with very heavy rain. The Barometer stationary as well as the Sympiesometer, heavy rain continued. At midnight fell calm, with baffling airs from Northward and Southward alternately.

1*st October.*—An increasing breeze from N. N. E., steering S. S. E. ½ E. about five knots; a turbulent cross sea on, but not high. 4 A. M. strong N. N. E. winds with squalls and incessant rain with a cross sea as above; at 6 to 7 A.M. hard squalls and drizzling rain, ship pitching heavily; at 8 A. M. squalls increased, attended with constant rain and windy appearance, reduced sail. Barometer 29.78, not fallen any since yesterday, and Sympiesometer 29.70. It continued steady from 8 A. M. to noon; strong N. N. E. winds with squalls and much rain, a cross turbulent sea at noon. Barometer fell suddenly to 29.68.; at 3 P. M. strong breeze from N. N. E. and rain and thick weather, wind falling light at times and freshening as suddenly again.* Made all preparations for bad weather, and brought the ship to the wind under double reefed main topsail and foretopmast staysail; at sunset strong wind approaching to a fresh gale, with unsettled thick weather, wind lulling and freshening at times from North to N. E. with a cross, turbulent, agitated sea and constant rain. Barometer falling a little; from 6 P. M. to midnight fresh gales and hard looking weather, no rain; midnight Barometer 29.50 falling. Sympiesometer 29.42. Close reefed the main topsail and in forestaysail, hove to under main topsail close reefed, head E. S. E.

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[*] These italics are mine, as this phænomenon is one to which too much attention cannot be paid.—H. P.

2nd October.—A. M. commences with strong gales, with squalls and light rain again; sea high and cross, ship easy, and not moving much, shipping no water on deck, lurching at times. Barometer fallen at 1 to 29.30. Sympiesometer 29.22. and falling; blowing a hard gale, pitching hard, and taking water on deck, increasing gale. Barometer falling fast; at 3-30 increased to a violent gale, steady at about N. N. E. with a high sea from the Southward, making it very cross, shipping a good deal of water on deck when the ship lurched. Barometer fell very suddenly since midnight from 29.30 to 28.30, and Sympiesometer 28.22, and falling still. Clued up the close reefed maintopsail, and although it was run up quick, before the men could get it well fast, it blew nearly to pieces; the wind increased suddenly to a violent storm, the drift making a clean sweep over us for several feet above the deck, the weather quarter-boat blew up to the rigging, got a rope round her to the rail. Just about 5-30 A. M. blowing a violent hurricane from about N. N. E., ship laying over three planks of her lee deck in the water; wind most terrific, the weather quarter-boat broke the davits, blew up about ten feet up the mizen rigging, and lay across and broke the planks in several places. Stove all the full water casks that were on deck and hove them overboard to ease the ship, now laboring very heavy and burying very much to leeward; masts bending and buckling with the force of the wind, ship buried to leeward as high as the rail. At 6 A. M. the fore-topgallant mast broke off above the cap, and likewise the main and mizen; put an extra batten on the after-hatch with long nails, the fore upper hatchway caulked down, the ship now laying over with her lee side all buried within two planks of the hatchway; the upper part of lee bulwark swept away and upper covering board split, the gun and carriage washed over the rail, the spars on the booms and longboat all fast; but the board on the booms adrift the wind having got under the boat, broke her lashing and blew her to pieces. Barometer still falling since 6 A. M.; at present 8 A. M. Barometer 27.92 and Sympiesometer 27.78. Blowing a terrific hurricane; ship much over, the lee side of the quarter deck quite buried, and the covering rail being apparently split, did not know the extent of the damage to leeward, it being under water; masts struggling and bending much, the foremast head gave way and fore-topmast fell over the side with yards, and our foreyard came down the foremast several feet; ship not rising at all, and wishing to wear her to get the lee side up, (hurricane still as violent,) cut away the main topmast backstays to ease the ship and try to righten her, as the fore topmast going did not appear to do so, and to save the mainmast, when the main topmast broke some feet above the cap, yards, &c. going with it over the side; still the ship lay over with most of the lee side of the deck under water, and not rising cut away the mizen shrouds to ease the ship, when the mizen mast went over the side, taking away the binnacles, compasses, boats, &c. &c. overboard, and carrying away the starboard quarter gallery, poop rail, and smashing the skylight and every thing on the poop. The ship rightened a little, broke the steering wheel and wounded a man on the poop; the sea washed into the starboard after cabin, (the Captain's,) and nearly filled it, and from it to the cuddy and other cabins, and a large quantity of water got down the companion hatch abaft the cuddy before it could be secured. Since 6h. 30m. A. M. until at present at 11 A. M., it had blown a terrific hurricane. Barometer stationary at 27.89, Sympiesometer 27.78; still blowing as furiously as ever. About a little after 11 A. M. the wind suddenly lulled very much, got the hands on the poop, got tackles on the tiller, the wheel being broken, and put it up; after some time the ship wore and cleared the deck of water, the sea knocked her about the stern in wearing, brought her to on the starboard tack; much lightning and dark overcast weather; heading up N. W. At a little before noon, the wind shifted in a flash of lightning suddenly to the S. S. E. from N. N. E. and blew instantly nearly as violent as it had before done, from N. N. E. Clapped the hands on the pumps, and kept at them sometime; but they were washed away, some rice coming with the water; ship apparently a list to starboard; dark overcast weather, the drift washing right over the ship ten feet above the deck; not able to look to windward. Cut away the wreck of the mizen mast, it being now to windward, but not before it had struck the rudder and shook it very much; it struck likewise under the counter before the ship was wore round, and shook the stern frame a good deal; threw every thing overboard that was about the decks as well as three provision casks that had washed out from under the top gallant forecastle where they were stowed, to prevent them from wounding the people; many having had their legs cut and other bruises. Two feet and eight inches in the well, but could not tell precisely, every thing being so wet; set to work at the pumps, a quantity of rice coming up with the water; pumps working well and heaving a large quantity of water; blowing very violently from S. S. E., *the lee sea coming nearly up to the pumps at times;** secured the foreyard and lashed the yardarm of the mainyard down to the ring bolts in the stanchion and kept it on end, to keep it steady; tried to get something on outside the quarter gallery, as the cabins were nearly full of water, but could not succeed; the men were washed away; blew a violent hurricane until about 4h. 30m. P. M. black overcast weather and lightning; when the extreme violence of the hurricane moderated a little; all hands at the pumps, continued at them until nearly 6 P. M. when the ship sucked. A large quantity of water in the cuddy and cabins, and some of it getting below as it washed about; succeeded in getting the quarter gallery door barricaded with canvass and battens, which kept part of the sea out. At 6 P. M. moderating to a hard gale, and glass rising slowly from 27.92 to 28.30. Sympiesometer 28.22, both rising together. Sympiesometer moved up first. Succeeded in stopping the water from getting in, got the water baled out of the cabin and cuddy, got some more of the wreck cut away, tiller loosened a little on the rudder head, got quite pitch dark, sent the men to rest in the cuddy. Barometer 28.50. Ship laying to, helm down, head E. N. E. to N. E., wind about S. S. E., cross turbulent agitated sea on, less water on deck, and violence of the storm moderating. From 9 to midnight strong gale and overcast weather, steady at S. S. E. Midnight ditto weather, ship rolling heavy at times, the Sympiesometer rose to 28.96, the Barometer got broke by striking against the side in one of the heavy rolls after the violence of the storm had subsided.

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* This is exactly the rising and falling of the wind described in the Seventh Memoir, vol. xi, p. 1000.

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* The italics are mine, this is partly a confirmation of my remarks on the danger of the lee sea in the First Memoir, vol. viii. Jour. As. Soc. p. 645.—H. P.

3rd October.—A. M. strong gale from S. S. E. and dark weather, but clearing away a little; ship laying to, head to Eastward, very easy and decks clear of water, great heat coming up from below. Sunrise hard gale and fair weather with passing clouds, wind S. S. E., ship laying to under bare poles, but not to the wind; clearing the wreck. Noon strong winds and fair weather. Sympiesometer 29.40. Thermometer 82°. Latitude observation 19° 46′, longitude chronometer 88°. Situation by account at midnight of the 1st, when the violence of the gale commenced and lasted to 4 A. M on the 2nd October, was latitude 18° 30′ North (about) and longitude 89° 0′ East. P. M. strong winds from the Southward, and cloudy weather. At 2, Sympiesometer 29.56. Thermometer 84°. Squalls at intervals and light rain, high sea on from S. E. Employed clearing wreck and getting the foreyard up, set the lee part of the mainsail, a few cloths to leeward, the rest being all blown away, to keep the ship to; the foresail nearly torn to pieces, very high sea on. Midnight strong southerly winds, passing squalls at times. Midnight ditto. Finding ourselves at so little distance from the Sandheads, and a strong southerly wind blowing and likely to continue, and not being able *yet* to keep the ship to the wind, it being S. S. E. and quite dead foul, we determined to run back, kept away N. E. by N. under clew of mainsail, going about two knots.

4th October.—A. M. strong breeze from S. S. E. to South, with passing light squalls, kept the ship N. E. by N. ½ N. to check the westerly set that always prevails outside at this time. Noon, sea subsiding gradually, moderate breeze and fair weather. Latitude by observation 20° 12′ North, longitude per chronometer 87° 58′; had a strong set about W. S. W., and shortly arrived safe at Calcutta.

Report of the Ship Emerald Isle, Capt. J. Scales. *From the Marine Board.*

On the 1st instant whilst at anchor in the Eastern Channel, the weather became unsettled with the wind at East, the squalls rising about S. E., but striking us mostly from about East. About 4 P. M. gale and sea increasing, slipped and made sail to the southward. During the night it blew fresh with an increasing sea. About 5 A. M. on the 2nd, wind about E. S. E., gale increasing with such rapidity, that I was unable to shorten sail sufficiently quick, the weather beginning to assume a most wild and threatening appearance. About 1 P. M. the wind and sea had increased to that extent, and the ship so uneasy, I thought we should have been swallowed. Thermometer was then 82° and Sympiesometer 28$\frac{3}{12}$*, varying not more than a couple of tenths, until about 6 P. M., when it gradually rose, and the breeze had sensibly abated. The wind had then veered to South, but the hardest part was from the S. East; it blew hard in squalls during the night with deluges of rain, but by daylight had almost subsided. The Sympiesometer then 28.40, which at Noon rose to 28.50. Thermometer 84°, the wind then gradually drew round to the S. S. W., when the weather became clear and tranquil.

J. Scales,
Commanding Ship Emerald Isle.

Abridged Log of H. C. Steamer Tenasserim from Singapore, bound to Calcutta, reduced to civil time.

28th September, 1842.—Noon, latitude 14° 22′ N. longitude 93° 45′ E. Narcondam at 1h. 30m. A. M. W. by N. (distance not stated). Fine westerly breeze. P. M. to midnight, winds variable, N. N. W. to W. 4 P. M. Preparis E. by N. ½ N. (no distance).

29th September.—Fresh breezes N. W. by W. to W. N. W. No observations at noon. P. M. the same weather, Lat. account 16° 6′ N., longitude 92° 15′ E. 10 A. M. wind North. P. M. heavy squalls occasionally from N. W. Midnight wind N. W.

30th September.—A. M. strong breeze and thick cloudy weather, with a heavy cross sea, set storm stay sails. No observations. Latitude account 17° 24′ N., longitude 91° 28′ E. lying to. From 2 P. M. "wind *shifted** to a gale from S. S. W." Hove to under storm staysails. 5h. 30 strong gale, ship labouring much and so till midnight.

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* Captain S.'s Barometer was broken.

1*st October.*—A. M. wind lulling at intervals, wind (apparently) S. S. W. till 6 A. M. when wind marked S. S. E. "At 9¼ bore away N. W. by N. with a heavy swell." Noon, latitude observation 18° 2′ N., longitude account 90° 15′ E. P. M. wind S. E. fresh breezes and rain to midnight, when by account it would appear, that she was about in latitude 19° 33½′, longitude 89° 28′ E.

2*nd October.*—A. M. heavy squalls and rain S. E. 6-30 "fresh gale and dark rainy weather with a heavy southerly sea." 7 P. M. hove to under storm sails. At 10.15 in 70 fathoms water. Noon latitude observation 20° 47′ N., longitude 88° 10′ E. P. M. wind S. E., in 55 fathoms. Brisk gale to midnight, when fine.

3*rd October.*—A. M. wind S. E. 4 P. M. in 35 fathoms, and at 5 A. M. 80 fathoms, no ground (being on the Swatch). Noon, latitude 20° 56′ N. and squally. At 0.30 P. M. saw the Pilot.

Extract from the Log of the ship Halifax Packet, from Calcutta, bound to England. Forwarded by the Master Attendant, Point de Galle.

30*th September,* 1842.—At midnight the Pilot left us at the Sandheads, all possible sail set, wind N. N. E. steering S. S. E. Latitude at noon 21° 18′ N., longitude 88° 40′ E. Bar. 29.60. Ther. 82°.

1*st October.*—During the afternoon of this day the wind increased, double reefed the topsails, the wind veering from N. N. E. to East. Barometer and Thermometer same as yesterday.

2*nd October.*—At 2 A. M. civil time, the Barometer had fallen to 27.90, made all snug, the slings of the foreyard gave way, got the yard and sail secured across the forecastle, it then blowing a terrific hurricane. At 4 A. M. the bowsprit gave way, carrying away the foremast near the deck, the starboard bower anchor stock, starboard gangway rail, bulwarks, split the covering board, and stove the long boat. At 4½ the main topmast went over the side, carrying with it the main cap and part of the mast head; cut away as much of the wreck as possible to save the rudder and ship. The crew, although strong and numerous, very inefficient. At 5, the typhoon at the highest possible state of fury, the mizen mast went over the starboard quarter, carrying with it the boom, gaff, binnacles, compasses, broke the steering wheel, and started the upper rudder brace, also a sky-light hatch, signal chest, stancheons and every thing on the poop; the ship completely under water, yet leaking but little. About noon the wind veered to South, and became more moderate. The Barometer getting rapidly up, but a high sea; the ship rolling fearfully. Barometer at noon 28.90, at 8 P. M. 29.00′. Lat. 19° 26′ N., long. 88° 30′ E.

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* Wind not marked, but apparently from W. N. W. when the shift took place.

3rd October.—On the morning of this day cleared away the wreck, saw two ships dismasted and stern frame of a third, with the name in white letters, but could not read them, the sea high and the crew as much disabled as the ship; every thing full of water. Books, charts, clothes, nautical instruments and one chronometer all spoiled; wind S. S. W. Barometer at 4 A. M. 29.40, at noon 29.50.

4th October.—This day the ship rolling dreadfully, quite under water; nothing could be done but keeping her pumped out; found a great quantity of our bread in a damaged state, wind moderated from South. Barometer 29.70. Latitude 19° 46′ N., longitude 87° 50′ E.

From MR. BOND, *Master Attendant at Balasore, I have been favored as usual with the following able Statements of the Winds and Weather.*

I have the pleasure to forward an account of the breeze here on the 1st to the 7th October 1842, up to which time the wind was variable, with cloudy weather and rain. The Barometer only fell to 29.52, thereby indicating rain more than wind, which indeed proved correct; the sea rose above high water mark, occasioned by the wind to the Southward, and three Salt Vessels were driven ashore and two Telingahs, also three Maldive boats foundered below Chooramoon; the people of two of them having been saved in their boats, the other people were supposed to have gone ashore near Hidgelee. No other vessels were lost north of Point Palmyras; but to the southward of the Point numbers were driven ashore and foundered, and many lives lost. A range of hills (the Neelgherries,) stretches down from the northward in a line with Chooramoon, which place lies S. S. W. of Balasore, distant twenty miles. On the N. E. side of this range of hills the winds were weak, (a top gallant breeze only,) whilst it increased on the S. W. side of Chooramoon, and onwards to Pooree and the Chilkah Lake, to a complete hurricane, for the coast was strewed with wrecks, besides several ships being completely dismantled, and some having foundered.

Oct. 1842.	Ther. 2 P. M.	Bar. 9 A. M.	Bar. 3 P. M.	Bar. 5 P. M.	Remarks.
1st October,	83	29.80	29.71	29.67	N. W. to N. E. rain.
2nd ditto,..	80	29.71	29.55	29.50	Top gallant breeze N.E., squally rain.
3rd ditto,..	82	29.62	29.65	29.64	S. E. puffy rain, squally do.
4th ditto,..	83	29.74	29.70	29.70	S. E. ditto ditto.
5th ditto,..	84	29.68	29.70	29.69	S. E. ditto rain.
6th ditto,..	85	29.80	29.68	29.65	S. E. to S. W. rain slight.
7th ditto,..	85	29.80	29.80	29.77	S.W. fairer and variable N. W. and N. E.

The logs of the Pilot and Light Vessels will be found included in the Tabular statement. The following is the only document which I have of the state of the weather at Calcutta, which is followed by such reports from inland stations as have reached me.

Mateorological Register kept at the Surveyor General's Office, Calcutta, for the Month of October, 1842.

Days of the Month.	Moon's Changes.	MINIMUM TEMPERATURE, OBSERVED AT SUN RISE.						MINIMUM PRESSURE, OBSERVED AT 9 H. 50 M.					
			Temperature.			Wind.			Temperature.			Wind.	
		Barometer.	Of the Mercury.	Of the Air.	Of an Evaporating Surface.	Direction.	Aspect of the Sky.	Barometer.	Of the Mercury,	Of the Air.	Of an Evaporating Surface.	Direction.	Aspect of the Sky.
		Inches.	° ′	° ′	° ′			Inches	° ′	° ′	° ′		
Oct. 1		29.650	80.5	78.0	76.0	S. W.......	Rain Thundering,	29.681	83.9	86.5	82.0	N. E.	Cirro-strati.
,, 2		.620	79.0	76.2	76.0	N. E. (high)	Drizzly, Thunder and fresh Gale.	.650	79.8	78.0	76.0	(high) N. E.	Raining.
,, 3		.613	80.2	79.5	77.4	S. E.	Cirro-strati.	.674	84.1	87.0	82.0	S. E.	Cumuli.
,, 4	●	.665	81.0	79.7	78.0	E.	Generally Clear.	.722	84.6	86.6	82.1	S.	Scattered Clouds.
,, 5		.661	81.0	79.9	78.0	Calm, ...	Cumulo-strati.	.690	84.0	85.0	81.0	S.	Cumulo-strati.
,, 6		.610	81.8	80.0	78.0	S. E.	Cloudy, Thundering	.638	82.0	83.0	79 8	S. E.	Cloudy, Distant Thundering.
,, 7		.626	79.6	78.0	75.0	Calm, ...	Cloudy.	.713	83.4	85.0	79.0	N. W.	Cirro-strati.
,, 8		.670	80.5	79·7	77.8	S. W.......	Clear.	.700	83.8	87.5	80.8	W.	Clear.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for the Month of October, 1842.

Days of the Month	Moon's Changes.	OBSERVATIONS MADE AT APPARENT NOON.						MAXIMUM TEMPERATURE, OBSERVED AT 2 H. 40 M.						
			Temperature.			Wind.			Temperature.				Wind.	
		Barometer.	Of the Mercury.	Of the Air.	Of an Evaporating Surface.	Direction.	Aspect of the Sky.	Barometer.	Of the Mercury.	Of the Air.	Of an Evaporating Surface.	Thermometer exposed to the Sun's ray's.	Direction.	Aspect of the Sky.
		Inches	° ′	° ′	° ′			Inches	° ′	° ′	° ′	° ′		
Oct. 1		29.669	87.4	88.5	84.0	E.	Cirro Cumuli.	29.618	87.0	90.0	83.0	104.0	E. ...	Cirro Cumuli.
„ 2		.622	80.0	77.5	76.0	(high) N. E.	Raining, and fresh [gale.	.597	80.5	80.0	78.0	82.5	(high) E.	Nimbi.
„ 3		.665	84.9	86.0	82.0	S. E.	Nimbi.	.635	85.9	88.5	83.0	107.0	S..	Cloudy.
„ 4	●	.721	86.0	87.2	82.0	S.	Cumulo-strati.	.665	86.1	87.2	82.0	93.0	S.......	Cloudy partially.
„ 5		.669	85.8	88.0	83.3	S. E.	Cumulo-strati.	.613	86.8	89.0	82.3	109.0	S.......	Cumulo-strati.
„ 6		.610	82.0	82.2	79.7	S.	Nimbi.	.581	83.9	85.3	81.9	100.0	S.......	Cumuli.
„ 7		.693	85.0	87.7	80.1	W. S. W. ..	Cumuli.	.670	85.2	88.9	80.9	112.0	S. W. ..	Cumuli.
„ 8		.636	86.0	90.0	82.7	W.	Clear.	.650	86.2	90.0	82.6	111.0	W.	Cumuli.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for the Month of October, 1842.

		MINIMUM PRESSURE, OBSERVED AT 4 P. M.						OBSERVATIONS, MADE AT SUNSET.						Rain Gauges.		
			Temperature.			Wind.			Temperature.			Wind.				
Days of the Month.	Moon's Changes.	Barometer	Of the Mercury.	Of the Air.	Of an Evaporating Surface.	Direction.	Aspect of the Sky.	Barometer.	Of the Mercury.	Of the Air.	Of an Evaporating Surface.	Direction.	Aspect of the Sky.	Upper.	Lower.	Moon's Horizontal Parallax at Noon.
		Inches	° ′	° ′	° ′			Inches	° ′	° ′	° ′			Inches	Inches	
Oct. 1		29.600	87.4	88.7	83.2	E.	Cloudy.	29.608	86.0	85.7	80.2	S. E.	Very Cloudy.	1.34	1.37	61
„ 2		.589	81.0	79.1	77.0	(high) E.	Nimbi.	.582	80.0	78.0	76.5	(high) E..	Nimbi.	0.54	0.59	61
„ 3		.634	84.7	86.0	81.0	S.........	Cloudy.	.642	83.5	84.0	80.2	S. E.	Nimbi.	0.05	0.08	61
„ 4	●	.653	86.0	88.0	82.5	S.........	Cumulo-strati.	.660	85.2	86.0	81.0	S.........	Cirro-strati.	..	..	61
„ 5		.605	86.0	88.0	83.0	S.........	Cloudy partially.	.610	84.7	84.5	80.2	S.........	Cloudy.	0.22	0.27	60
„ 6		.577	84.1	85.2	81.8	S.........	Cumuli.	.589	83.2	83.0	80.2	S.........	Generally Clear.	0.25	0.31	59
„ 7		.665	85.2	88.5	81.7	W. S. W.	Cumuli.	.670	84.5	85.5	80.3	Calm.	Generally Clear.	..	..	59
„ 8		.646	85.7	89.0	81.4	W.	Cumuli.	.650	84.8	84.9	80.4	Calm.	Cirro-strati.	..	..	58

The Observations after Sunset are made at the Hon'ble Company's Dispensary.

Days of the Monnth.		Moon's Changes.	Observations made at 8 p. m.				Observations made at 10 p. m.			
				Temperature.				Temperature.		
			Barometer.	Of the Mercury.	Of the Air.	Of an Evaporating Surface.	Barometer.	Of the Mercury.	Of the Air.	Of an Evaporating Surface.
			Inches.	° ′	° ′	° ′	Inches.	° ′	° ′	° ′
Oct.	1		29.825	84.75	85.25	84.25	29.825	84.36	85.25	84.25
,,	2		.775	82.0	81.5	80.5	.750	81.75	81.0	80.0
,,	3		.886	83.25	84 0	83.75	.850	83.0	83.1	81.0
,,	4		.900	85.0	84.0	83.75	.900	84.25	83.25	82.2
,,	5		.796	85.0	84.25	84.0	.813	84.25	84.0	83.25
,,	6		.750	83.0	83.5	81.5	.755	8.35	83.2	81.0
,,	7		.900	84.25	84.0	83.5	.866	84.0	84.0	83.5
,,	8		.850	85.5	85.0	84.75	.875	85.5	84.75	84.5

The following Memorandum is from my friend Wm. Peacock, *Esq., who was, at the time of which he writes, on the river in a Boat.*

Being about 10 or 12 miles above the mouth of the Bhagruttee (about latitude 32° 32′ N. longitude) 88° 20′ on the 5th October, I observed in the evening the wind was from the Eastward, gradually lulling as night came on. After sunset a very heavy bank of clouds visible all along the horizon, commencing a little East of North and running round Eastward to nearly South. During the night of the 5th, the wind sprung up again, but from the North East; and it was blowing fresh from that quarter all the forenoon of the 6th till about 12 or 1 o'clock, when heavy squalls came up from the South-East, succeeding each other at intervals of half an hour, and so on till between 3 and 4 p. m. when the weather cleared a little; but it still blew fresh from South East, with an occasional shower till evening. I was by that time in a very sheltered situation, and could not well feel the weather as I did in the morning of the 6th, and during the middle of the day, all which time I was knocking about in the open river, and exposed to the full power of the storm.

Wm. Peacock.

The following note from Purulia, by Capt. Hannyngton, *B. N. I. is the only trace I have of any storm in the line between Cuttack and Gya.*

Purulia, 11*th April,* 1843.

The fact is, that we had a brisk gale here for one day during the first week of October, and pretty full memoranda of the Barometrical changes were noted down by a friend who was then here, and who instead of at once writing them in the memorandum book, committed them to a scrap of paper, which has unfortunately been mislaid. I have searched for it long and in vain. So far as my memory serves, the gale began here on the night of Sunday the 2nd October, and blew from North veering to West, in which quarter it moderated, and ceased in the afternoon of the 3rd. Seeing it was so short, and no notice being taken of it by you, I supposed that it was of no consequence, and therefore did not send a report. You will say that nothing of the kind can want some degree of consequence, and that the memorandum should have been sent. Very true; I will behave better next time. I have much occupation, and do not keep a daily register.

Lieutenant SHERWILL, *B. N. I. employed on the Revenue Survey, has kindly sent me the following Note from Gya.*

We had a violent storm at this place (Gya) on the 5th October. It commenced early in the morning (sun-rise) of the 5th from the S. E. and blew with a half-gale-like strength till night-fall, when its strength increased, and it blew furiously till the morning. About 8 A. M. on the 6th, it veered round to the S. W. and blew till 12 noon, when it faded away, having lasted 30 hours, and doing some damage by blowing down trees, &c.

The storm from its commencement till close, was accompanied (with the exception of short intervals) by heavy rain; heavier than had occurred during any part or time of the rains.

No lightning or thunder during the day visible or audible; but during the night, continued peals of thunder followed in quick succession.

The whole country was flooded from the rain, tanks filled to overflowing, and in fact, the storm has proved a blessing to this part of the world.

W. S. SHERWILL.

From Pussewa, near Jounpore, Lat. 25° 40′ N., *Long.* 83° 2′ E., *I have from* V. TREGEAR, *Esq. the following account of the Storm.*

I send a few notes taken during a severe storm with which we have unfortunately been visited. I hope you will be able to lay down its course by the aid of other reports, which I doubt not will be made to you. Great injury has been done to the cane crop in general, and my indigo has also suffered greatly.

Notes during the Storm of the 5th and 6th October 1842. Pussewa, 12 miles E. of Jounpore.

Date.	Time.	Bar.	Ther.	Wind.	Remarks.
3rd.	Noon.	29.5	...	E.	Fresh breeze, with occasional light showers.
„	6 P. M.	...	...	...	Breeze rising.
4th.	Noon.	29.4	...	E.	Strong breeze, with frequent showers; clouds in two strata, lower one driving very rapidly to W., upper moving very slowly in the same direction, occasional breaks showing the clear sky.
„	P. M. 5. 30.	...	...	...	Heavy rain and breeze increasing.
5th.	A. M.	...	...	E.	High wind and showers.
„	Noon.	29.25	...	...	Ditto ditto.
„	P. M. 3.	29.1	...	...	Very high wind, with rain.
„	6.	...	...	...	Ditto ditto, and heavy rain.
„	Midnight.	...	...	N. E.	Strong gale, with rain.
6th.	A. M. 3.	29.0	...	N.	Gale increasing, with violent gusts, which was the character of the storm during the past night; many trees blown down, and innumerable branches torn off.
„	7.	...	72°	N.	Violent storm, with rain.
„	10.	29.05	...	...	Gale continuing, but sky clearing, a few minutes of sunshine. Barometer began to rise.
„	Noon.	29.1	76	N. N. W.	Gale decreasing.
„	P. M. 1.	29.15	...	N. W.	Ditto.
„	2.	29.2	78	N. W. by W.	Ditto, strong breeze only.
„	3. 40.	29.25	...	W. N. W.	Light breeze.
„	5.	...	...	W.	Ditto, low clouds driving very fast to S. E., heavy bank from N. W. round by N. to S. E,
„	6.	...	...	W.	Heavy rain from N. W.
„	P. M. 6. 30.	...	...	W.	Clearing up, fresh breeze.
„	8.	29.3	78	...	Cloudy, with very light rain.
7th	A. M. 6.	29.4	80	W.	Clear, with pleasant breeze.

E. C. Ravenshaw, *Esq., C. S., Commissioner of Revenue for the Patna District, has obliged me with the following Notes from that Station :—*

I observe there has been a heavy gale at Cuttack on the 2d instant, which extended far into the interior. As it is probably connected with a violent and continued gale experienced at this station, I enclose the very imperfect notes made by me while it lasted.

Date.	Bar. at 10½.	Ther.	Rain.	Remarks.
Oct. 2 & 3	Not. marked	0	0	Blowing fresh from East.
„ 4	29.81	84	.12	Ditto ditto.
	29.73	83	——	Ditto, at 6 p. m. rain commenced, continued pouring all night. Gale increasing.
„ 6	29.51	81	4.50	Gale continues, trees blown down in all directions, wind shifted to the South; at 5 p. m. to the West, from which quarter until midnight it blew furiously, but with little rain.
„ 7	29.74	79	.12	Calm. E. C. Ravenshaw.

To Lieut. Chamier, *of the Ordnance Department, I am obliged for the following account of the Storm at Allahabad.*

Possibly the following hasty Memo. of a gale of wind we had here at the beginning of the month may prove useful, as a hint to other information :—

Memo.

October 1st and 2nd.—Strong Easterly winds and clouds, with occasional showers.

3rd.—Ditto ditto during the day, increased after sun-set, and during the night blew a gale, towards morning (4th) moderated.

4th.—Much the same as yesterday, with occasional heavy gusts and showers. At 8 p. m. increased to a strong gale, wind East and E. N. E.

5th.—Eight o'clock a. m. gale from E. and E. N. E. very strong; 11-30, moderated, heavy showers; 4 p. m. strong wind from E.; 7, moderate ; at midnight increased to a strong gale.

6th.—Gale continued from E. and E. N. E. till day-break, when it decreased and commenced clearing up, the wind changing to N. E., N. and finally West, in which quarter it remained nearly steady.

Between the 1st and 6th, 1.74 inches of rain fell.

THERMOMETER.

October 1st,	10 A. M.,	86 Fahrenheit.
„	Noon,	21 „
„	4 P. M.,	93 „
„ 2d,	Not observed,	
„ 3d,	10 A. M.,	86 „
„ 4th,	Not observed.	
„ 5th,	10 P. M.,	80 „
„	Noon,	80 „
„	4 A. M.,	80 „
„ 6th,	10 A. M.,	83 „
„	Noon,	89 „
„	4 P. M.,	88 „

GEO. G. CHAMIER, 1*st Lieut.*
Com. of Ordnance.

The following report from Agra has been sent me by Dr. Balfour, Surgeon to the Honorable the Governor of the N. W. Provinces.

Sympiesometer and Thermometer for the first 10 *days of October* 1842, *at Agra.*

Day of M	Ditto of Week.	Thermometer at 10 A. M.	mpiesor at 10 A.	nd	Thermome 4 P. M	Sympiesom at 4 P. M.	nd	Remarks.
1	S.	87½	29.13	N. E.	88½	28.94	N. E.	
2	Sun	88	·16	vble.	88	29.01	N. E.	P. M. cloudy and slight shower.
3	M.	87	·15	E.	85½	·02	Nly.	P. M. fine shower.
4	T.	86	·12	N. E.	86½	28.98	N. Ely	Cloudy all day, fine rain in afternoon, heavy continued rain from 10½ to 4 P. M., at times cloudy.
5	W.	85	·07	N. E.	82¼	·98	N. E.	
6	T.	83¼	·10	Ely.	85½	·96	Cm.	
7	F.	82½	·15	W.	84½	29.05	W.	
8	S.	83	·12	W.	84	·00	N. by E.	Shower at 8 P. M.
9	Sun	83½	·11	Cm.	84½	·01	N. E.	
10	M.					..	...	Absent from the station.
11	T.	82½	·38	Cm.	84	·28	W.	

MY DEAR SIR,—The above may be interesting, as I see you have had a gale at Cuttack during the time, for which I give you a copy of my Register. Easterly winds, from my experience, are rare here in October, and rain too is unusual; the jump of the Sympiesometer on the 11th has been sustained, it never having fallen below 30 (in the morning) since.

J. BALFOUR.

I now, as in former Memoirs, give a tabular view of the Winds and Weather on different days, including in it the logs of the Pilot and Light Vessels, and shall then proceed to the concluding summary of the grounds on which I have laid down the track of the Storms.

Tabular View of the Storms of 2d and 3d October, 1842.

Date.	Name of Places or Ships.	Winds and Weather.	Lat. N.	Long. E	Barometer.	Simp.	Ther.	Remarks.
Noon 1st Oct. 1842.	Essex,.. ..	.. A. M. variable, P. M. to midnight increasing breeze, cloudy and squally W. S. W. to N. N. E. gale at midnight.	16°.0	83.50	8, 129.836 10, 29.766 Midt. 29.586	.. ..	82 81 80	Confused sea, dense clouds to the Northward.
	Lion, ...	.. W. N. W. Cloudy and 8 knot breeze.	13.0	81.41	.. .. ..	.. ..	.. ..	Steering to the Northward and Eastward.
	At Pooree, ..	.. Gale commenced at night, blowing fresh from North.						
	At Cuttack, ..	.. A M. heavy rain. Noon N. N. E. and N. E. 8 P. M. increasing to fresh gale from North...	.. ..	.. ..	.. .. ..	.. ..	.. ..	1st to 2d, 3 inches of rain.
	Eliza, ...	.. Increasing from N. N. E. with squalls. P. M. thick weather. Midnight gale commenced..	Midnight 18.30	89.0	8 A. M. 29.78 Noon 29.78 3 P. M. 29.68 Midnight 29.50	29.70 .. .. 29.42	.. ..	Standing to sea to the S. S. E. 3 P. M. hove to.
	Emerald Isle,	.. Squally from East and increasing. Midnight blowing fresh..	.. ..	.. ..	.. .. ..	.. ..	.. ..	At Anchor Eastern Channel. 4 P. M. slipped and put to sea.
	Halifax Packet,	.. P. M. wind increasing N. N. E. to East.						
			H. C. Pilot and Light Vessels.					
	H. C. F. L. V. Hope,	To Noon increasing N. E. breeze & squalls, with rain, thunder and lightning. 4 P. M. blowing hard from Eastward. Sunset moderate gale East. 8 P.M. heavier, East. Midnight the same, E. N. E.	.. ..	.. ..	8 A. M. 29.65 Noon 29.61 8 P. M. 29.52	.. ..	82 81 82	30th September midnight stormy, Easterly breezes and threatening weather. Bar. 29.63. Ther. 84.

Date.	Name of Places or Ships.	Winds and Weather.	Lat. N.	Long. E.	Barometer.	Simp.	Ther.	Remarks.
1st Oct. 1842.	H. C. L. V. Beacon.	Stormy, Northerly breezes & cloudy, veering at 4 P. M. to E. and E. S. E. with hard squalls and heavy rain. 8 A. M. N. E. Noon E. N. E. to E. S. E. 4 P. M. E. S. E. to S. E. 8 P. M. S. E. to N. E. blowing hard. Midnight heavy gale at N. E.	21.04	88-27	.. .. ..	.. ..	.. ..	Very threatening weather and *strong. Weterly set.* 180 fms. Cable out.
	H. C. P. V. Saugor,	1-30 heavy squall from E. by S. to daylight. At noon half a gale E. to E. S. E., rain and heavy sea. ..	Lower Floating Light N. N. E. ½ E. 3¼ miles.					
	H. C. P. V. Megna,	Wind from E. N. E. to East, latterly stormy, Easterly breezes and heavy squalls.	In 9 fms. F. L. E. by N. P. M. 14 fms. S. Channel.		.. .. ..	.. ..	.. ..	Heavy sea making.
	H. C. P. V. Krishna,	Light breezes N. N. E. to N. E. Middle E. N. E to East. P. M. E. to E. by S. squally, with rain & threatening.	11 fms. Lower Light N. N. W.		29.59	.. ..	.. ..	Latterly threatening.
	H. C. P. V. Cavery,	A. M E. S. E. fine. Noon E. N. E. to East, squally, lightning, &c.	At anchor 10 fs. F. L. N. E. by E.		.. .. ..	.. ..	.. ..	3 P. M. every appearance of a gale; made due preparations.
Noon. 2d Oct. 1842.	Essex,..	Increasing gale veering S. W. to N. W. 9.30 W. P. M. moderating. Midnight W. S. W.	17.10	85.30	7. 29.436 9.30. 29.406 Noon 29.406 2 P. M. 29.436 4. 29.836 Midn. 29.836	.. ..	81 82 84 83	
	Lion, ...	Increasing breeze S. W. to W. S. W...	15.9	85.21	.. .. ..	.. ..	.. ..	Bad appearance, running to the N. E. 7 to 9 knots per hour.

Date.	Name of Places or Ships.	Winds and Weather.	Lat. N.	Long. E.	Barometer.	Simp.	Ther.	Remarks.
2d Oct 1842.	At Pooree, ...	A. M. heavy gale in gusts from due N. 6 P. M. shifted to E. N. E. 8 heavy gale S. E. 10 S.S. E. 12 South.	.. ..	.. ..	.. ..	.. ..	78 76	Thunder and lightning after shift of wind.
	At Cuttack, ...	Fresh gale and heavy squalls from North to N. E. Noon increasing N. & N. N. E. 4 P. M. stormy gale North, furious squall N. and N. N. E. Midnight rasping gale N. and N. N. E. ..	.. ..	.. ..	.. ..	.. ..	.. ..	Strength of the gale from Noon to Sunset of this day.
	Eliza, ...	Strong gales and at 3.30 violent gale N. N. E. 5.30 violent hurricane N. N. E. 11 A. M. terrific hurricane. About Noon shifted from N. N. E. to S. S. E. 4.30 moderated a little to hard gale to midnight... ..	.. ..	.. ..	1 A. M. 29.30 3.30. 28.30* 8. 27.92 11. 27.19 6 P. M. 28.30 Broken.	29.22 28.22 27.78 27.78 28.22 28.96	.. ..	Heavy sea *from the Southward* at 3.30. Lightning with the shift of wind.
	Emerald Isle, ..	5 A. M. E. S. E. gale rapidly increasing. 6 P. M. S. abating.	.. ..	..	2 A. M. 27.90 5 A. M. Tyfoon.	1 P. M. 28.3	82	Hardest part from S. E.
	Halifax Packet, ..	2 A. M. to Noon hurricane about N. E? Noon veered to South.	19.26.	88.30.	Noon 28.90 8 P. M. 29.00			
			H. C. Pilot and Light Vessels.					
	H. C. L. V. Hope...	A. M. to daylight moderate gale E. N. E. to E. S. E. 8 A. M. to Noon East 4 P. M. S. E. Sunset S. E. by S.. 8 P. M. to midnight S. E. gale and squalls, wind and rain throughout.	.. ..	.. ..	8 A. M. 29.52 Noon 29.42 4 P. M. 29.40 8 P. M. 29.41	.. ..	80 82 80 82	

* This remarkable fall is specially noted, and confirmed by the Sympiesometer.

Date.	Name of Places or Ships.	Winds and Weather.	Lat. N.	Long E.	Barometer.	Simp.	Ther.	Remarks.
2d Oct. 1842.	H. C. L. V. Beacon,	Heavy gale at E. N. E. to East 8 A. M. East to 4 P. M. Sunset E. S. E. 8 P. M. E. Midt. a hurricane at E.S.E.	.. .. ..	.. ..	.. .. ..	.. ..	.. ..	Heavy squalls and sea with passing light rain *a strong Westerly set*, dismal weather throughout.
	H. C. P. V. Saugor,	East to E. S. E., blowing half a gale throughout. ..	Floating Light N. E. 5 miles. P. M. E. ½ N. 7 miles.		.. .. ..	.. ..	.. ..	Tremendous sea rising and frequently breaking over the Vessel, almost sweeping the decks, 150 fms. cable.
	H. C. P. V. Megna,	E. N. E. to E. S. E. Fresh gales with hard squalls & rain. 4.30 increasing middle hard gales, with heavy squalls E. to E. S. E. ..	At anchor 20 fms.		.. .. ..	.. ..	.. ..	Daylight driving with 110 fms. and again with two anchors 145 and 125, fms. riding very hard.
	H. C. P. V. Krishna,	Daylight blowing hard E. to E. by S. and E. S. E. and threatening.	At anchor 11 fms. as before... ..		.. .. ..	.. ..	.. ..	Heavy sea throughout, riding with 200 fms. cable.
	H. C. P. V. Cavery.	Blowing very hard E. to E. by S. Noon E. S. E. 8 to 10 P. M. E. S. E. 10 to 12 S. E. Midnight about S.	Floating Light N. E. by E.		.. .. ..	.. ..	.. ..	Heavy sea, squalls and rain throughout.
Noon 3d Oct. 1842.	Essex,..	Fine.	19.10	89.25	29.886			
	Lion, ...	S. S. W. fine; heavy sea.	17.20½	85.21	.. .. ..	.. ..	.. ..	From 2d current of 90′ to the Eastward.
	At Pooree, ...	1 A. M. violent gusts from South abating to brisk gale P. M. S. S. W.	.. ..	.. ..	.. .. ..	.. ..	.. ..	Rain 8 A. M. of 2d to 8 A. M. of 3d, 5 $\frac{1}{10}$ inches.
	At Cuttack, ..	A. M. a lull. 6 A. M. strong breeze E.S.E. & S. E. increasing, latterly moderate.						
	At Pooree, ...	A. M. a lull. 6 A. M. strong breeze E S. E. and S E P. M. moderating. ..						
	Eliza, ...	A. M. strong gale S. S E. but clearing away. Noon strong winds and fair. Midnight strong Southerly winds...	19.46	88.0	.. .. ..	6 A. M. 29.40 2 P. M 29.56	82 84	

Date.	Name of Places or Ships.	Winds and Weather.	Lat. N.	Long.E.	Bar.	Simp.	Ther.	Remarks.
Noon 3d Oct. 1842.	Emerald Isle, ...	Fine, drawing to S. S. W...	.. .. ..	.. ....	.. ..	28.50	84	
	Halifax Packet, ..	Wind S. S. W.	.. .. ..	.. ....	..29.40	29.50		
		H. C. Pilot and Light Vessels.						
	H. C. F. L. V. Hope,	A. M. Heavy gale E. to S. E. daylight moderate S. E 8 A. M. blowing hard and lulls, a S S. E. Noon S. clearing. Sunset heavy gusts South to midnight strong Southerly winds and fine heavy sea..	.. ..	.. ..	8 A. M. 29.42 Noon 29.57 8 P. M. 29.65	.. ..	84 84 83	
	H.C. F.L.V. Beacon,	Stormy gales E. S. E. to fresh gales at daylight E. S. E. to S. S. E. 8 A. M. clearing. Noon S. S. E. and fine. 4 P. M. strong S. S. E. to moderate breezes at midnight.	Station.					
	H. C. P. V. Saugor,	Weather breaking. Noon S. to S. S. E. Midnight strong Southerly breezes.	Fng Lt. E b N. 6h Do. S. E. 4′					
	H. C. P. V. Megna,	4.30 Heavy gale E. to E. S. E. Daylight E. N. E. to E. S. E. 2 P. M. wind shifted to S. and S. S. W. gale much abated at 8 P. M., when fresh breezes S. to S. S. W.						
	H. C. P. V. Krishna,	Daylight strong breeze S. E., latterly S. S. E. ..	.. .. ..	.. ....	.. ..	.. ..	.. ..	Heavy sea throughout.
	H. C. P. V. Cavery,	Midnight to 2 A. M. S. S. E. to S. S. W. to 4 A. M. S. E. Noon S. W. by S. P. M. S. S. W.	Fng. Lt. N. E. by E.	.. ....	.. ..	.. ..	.. ..	Heavy sea and hard squalls.

	Name of Places or Ships.	Winds and Weather.	Lat. N.	Long. E	Barometer.	Simp.	Ther.	Remarks.
Noon. 4th Oct. 1842.	Lion, ...	Squally but fine, ...	20.23	.. ..	.. ..	.. ..	.. .. ..	Soundings 80 fms. saw a dismasted Vessel.
	At Pooree, ...	Fine, with fresh S. W breezes.						
	At Cuttack, ...	A. M. increasing North, N. N. E. to N. E. 4 P. M. strong gale Northerly; furious squalls N. and N. E. Midnight rasping gale N. and N. N. E.						
	Eliza, ...	Strong breeze S. S. E. to South, subsiding gradually.	20.12	87.58	.. ..	.. ..	.. .. ..	Strong set W. S. W.

H C. Pilot and Light Vessels.

Name of Places or Ships.	Winds and Weather.	Lat. N.	Long. E	Barometer.	Simp.	Ther.	Remarks.
H. C. F. L. V. Hope,	Strong Southerly and S. S. E. breezes and unsettled, latterly fine.	.. ..	.. .. ..	8 A. M. 29.72 Noon 29.68 8 P M. 29.66	.. .. ..	.. 82 .. 85 .. 83	
H. C. F. L. V. Beacon,	Southerly and hazy weather.						
H. C. P. V. Saugor,*							
H. C. P. V. Megna,*	S. S E. to S. and fine. ..						
H. C. P. V. Krishna,	Pleasant breezes S. S. W. to S.						
H. C. P. V. Cavery,	Fine S. S. E. to South. ..						

NOTE.—*In replying to some Queries, Mr. Branch Pilot Cearns, H. C. P. V. Saugor obliged me with the following: the italics are mine.*

The last gale was attended with few of the general signs that generally appear in these Latitudes. On the 30th of September, the weather had a fine appearance, as if the monsoon was about to set in, we had a nice N E. breeze. 30th at night it grew cloudy and heavy rainy appearance to the Eastward and S. E.

Towards midnight these clouds assumed the most singular appearance, by which I mean, that it lightened like the flash of a gun (no report of thunder,) and then spread in thin sheet lightning along the whole horizon from about E. by N. to S. E. It had so singular an appearance in the clouds, that I remarked it to several Officers on board at the time, and the universal opinion was, that they had bad weather to the Eastward; but that it would not reach us, or only in the shape of rain. On the 1st October, at 1 A. M. we had a smart squall at E. S. E. with thunder, lightning and very heavy rain. At day light the weather did not look at all suspicious. At this time there was not any set, but a long heavy swell rolling in from the S. E. as if it was blowing hard in that quarter. As the day advanced, so the wind increased in squalls, *the set increased also to about three knots to the W. N W. on the flood, and about W. S. W. on the ebb.*

2d October, with the ebb the sea rose to a tremendous height, as you will see by the sufferings of the Saugor in her Log.

3d. Sea abating very little till we got to the Eastward into deeper water.

4th. All over; fine serene sky with light S. W. winds, and light showers of rain at intervals

Our Barometer was very high 29.30, to 29.28, the whole of the gale.

4th November, 1842.

In reply to some enquiries, Mr. Branch Pilot SHARLING *favours me with the following Note relative to the Westerly set which prevails in these Gales.*

The reason that the rate of current was left out in the logs, is, that I thought it would be of no use, but as you wish for it, the set run to W. N. W. on the flood, and on the ebb to W. S. W. from 3 to 3½ knots.

The " *Megna*" has no Barometer on board.

SUMMARY.

I now proceed to state the grounds on which I have laid down the track assigned to these Storms on the Chart.

On the 1*st October.*—Commencing from the Southward, we find by our tables that the *Lion* in 13° N. had nothing but a strong W. S. W. monsoon, but the *Essex* in 16° N., longitude 83° 50′ E. at noon had a falling Barometer from 29.836 to 29.586 at midnight with the wind increasing to a N. N. E. gale at that time. At Pooree and Cuttack the storm commences also " at night" on the 1st, with strong breeze from the North, and the *Eliza* standing to sea, was at midnight in 18° 30′* N., longitude 89° 0′ E. with her gale commencing also at N. N. E.

Of these data, the *Lion's* breeze was doubtless the monsoon, and the variable squalls of the *Essex* from W. S. W. to N. N. E. at midnight, the first effects of the storms, which as the ship was only 80 miles from the high land of Vizagapatam and the ranges of hills close to and at the back of that part, were probably deflected to a N. N. E. instead of a N. N. W. gale, as the circles of them if extended to her position would require, as shewn by the arrow-line across the track of the *Essex.*

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* I take this latitude as set down, but it seems to me at least 20 miles too far to the Southward, for the *Eliza* on 30th September, at 7 P. M. had the Light Vessel bearing North, let us say at most 15 miles. She had then to midnight light baffling airs from North to South alternately, when she could not have made more than 10 miles more of Southing, or 25 miles from the Light Vessel in all. On the 1st, she had an increasing breeze of about 5 knots to 3 P. M. when she hove to, calling this 15 hours' run and at 6 knots it is but 90 miles, in all 115 miles. From 3 P. M. to midnight she was hove to, and allowing her to have made 2 miles per hour of Southing, or say 18 miles, this is but 133 miles in all, and part of it on a S. S. E. course. Now from the outer Light Vessel in lat. 21° 04′ to Lat. 18° 30′ there is a difference of 154 miles of latitude; while as above, we can make at the most but 133. I think this must have been an error of the copyist, but have taken it as set down, being always unwilling to *assume* errors in documents, unless they are evidently against common sense.

Captain McCarthy of the *Eliza* states, as before said, his gale to have "begun" at midnight from the N. N. E. in latitude *about* 18° 30′ N., longitude 89° 0′ E., its centre then must have borne about E. S. E. from him, at what distance we cannot exactly say; but I have taken it at 100 miles by projecting his subsequent drift, (as marked on the chart,) to Noon, when he had the centre of the storm passing him, and the shift of wind to S. S. E., and I have allowed also on the same grounds, that from midnight 1st October to Noon 2nd, the track of the storm was due West. This would place the centre of it at Noon on the 2d in latitude 17° 50′ N., longitude 88° 40′ E., as I have marked it; and this position being about on the meridian of the Light Vessels and Pilot station, gives them the Easterly winds and weather which they really had, being on the outskirts of a storm passing their meridian. I have also, it will be seen, marked the supposed place of the centre of this storm at midnight between the 1st and 2nd, and I need not I hope repeat here, that the whole track might have been a curve, or a succession of curves, for any thing we yet know, and that the strait lines are merely used to connect conveniently one point with another, and guide the eye.

But having thus marked the centre of the *Eliza's* hurricane at Noon on the 2nd, and we cannot well be far wrong in this, unless as before stated, there is any error in her latitude, we find that in the report from Pooree the Northerly gale which had blown there, increasing in strength from the night of the 1st, *shifted* at 6 P. M. to E. N. E., shewing that *a* centre of some rotatory storm had passed close to the station, or rather that the station was close to the verge of its calm space if there was one; since the gale abated in violence for about half an hour, and then blew with renewed strength, veering to the S. E. by 8 P. M., &c.

Now from the spot where we have marked the centre of the *Eliza's* hurricane to Pooree is a distance of 208 miles, and as the *Eliza* had her shift at Noon, and that of Pooree took place at 6 P. M., the interval of time is only 6 hours, during which, *if it was the same storm,* it must therefore have travelled at the rate of 39 miles an hour. This is a much higher rate than any we have yet found in the Eastern seas, or indeed in any part of the world; the highest rate supposed being I think 24 miles per hour in the Eastern seas, which I have inferred (6th Memoir, p. 699, vol. xi. of Journal of the Asiatic Society,) may have been the rate of the *Magicienne* and *St. Paul's* hurricane in the China sea, and 30 miles per hour assigned by Mr. Redfield, as that of the Atlantic storm delineated as Track No. VIII, in his Storm chart of 1835. Both these are much below this rate of 39 miles per hour, but we have good proof here, that it did occur, for the time must be correct, and the *Eliza's* position cannot be very far wrong, as to distance from Pooree.

Assuming then this rate for the present as one tolerably well ascertained, the reader will notice, that I have marked on the chart a track parallel to the former one, which starting from the supposed place of the centre of the storm at midnight 1st to 2d October, gives another centre at Noon of the 2d, and terminates at Cuttack. This marks the supposed place of the centre of the *Halifax Packet* and *Emerald Isle's* storm, which cannot, I take it, have been the same as that of the *Eliza.*

Before going into the examination of this question, however, I would request attention to the log and track of the *Tenasserim* Steamer.

This vessel was steering up from the S. Westward, passing Cape Negrais at about 120 miles to the Westward, and we find that on the 29th, she had the winds squally and variable from W. N. W. to N. W., and even North, when in about the latitude of the Cape, and these N. W. breezes with thick cloudy weather and a heavy cross sea continued till Noon on the 30th, *as if* she was skirting the S. Western quadrant of a storm forming between her and the Coast of Arracan, a supposition strengthened by the fact, that at Kyook Phyoo, which is only 190 miles to the N. E. of her track on these days, the winds were at S. E. as they ought to be if a circular motion existed or was forming. The weather, however, which was fine at Kyook Phyoo, was not decidedly a gale with the *Tenasserim* till the 30th, so we cannot on such slender grounds say, that any vortex really was formed; but *if there was so*, and if it had remained nearly stationary for the 29th and 30th, the winds and weather experienced by this vessel were such as it would produce. Is this really an instance of the stationary formation of a storm?

About noon on the 30th, we find that the *Tenasserim* then in latitude 17° 24′, longitude 91° 28′, had had the weather severe enough from the N. Westward to be lying to from 2 A. M., and that the wind then *shifted* to a gale from the S. S. W., which kept her under storm stay sails for the rest of the 24 hours. This shift, again, is what should occur, if we suppose, as before, a vortex forming to the N. E. of her track on the preceding days, and then suddenly moving on to the W. N. W., its centre passing near to the Northward of her position, for such conditions could give exactly a shift from N. W. to S. S. W. I have marked two small circles on the charts to guide the eye in considering this supposition, which I merely make in the absence of better data to regulate our views. I need not again repeat that storms must being *somewhere* and *somehow*, and the faintest light thrown on the phenomenon of their beginnings is of importance.*

We may perhaps assume this place close to the *Tenasserim* at Noon on the 30th, to have been the centre of the nascent storm on that day, and that while the vessel was drifting to the Northward with a S. S. Westerly gale, the storm was passing slowly to the Westward. This would gradually bring the wind for her to the S. S. E. as she got upon the N. E. quadrant of the storm, and so she, in effect, had it by 6 A. M. the morning of the 1st October, when she bore away to the N. W. by N., and running always on the N. E. quadrants of the two storms, had heavy S. Easterly breezes with a heavy Southerly sea to the Sand-heads. I regret much that this vessel's log is in some respects imperfect, and above all, that though a Government Steamer, she had apparently neither Barometer nor Sympiesometer on board ! for no observations of either are given. Observations of good instruments in her position would have been invaluable.

We should not forget to take into account in weighing all this, that Cape Negrais is a notorious neighbourhood for variable winds and shifting storms and gales, and that the *Tenasserim's* weather *may* have been mere local variations of the monsoon, and that thus the storms may have been generated 24 hours or more after she had crossed those parts of the Bay where our first circles are struck, and I have thus left the large one, which depends on the calculations derived from the *Eliza's* log, that the reader may weigh the probabilities between the two suppositions, which are, the one that between the 29th and 2nd of October, or during three days, the storm was forming and slowly moving on; and the other, that it formed and moved up as far between noon of the 1st and noon of the 2nd, as between noon of the 2nd and the time of the shift at Pooree, or at a rate approaching to such a velocity; which would then be the last supposed case of the storms having really crossed this spot twenty-four or more hours after the *Tenasserim* had done so.

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* I have supposed here and in former papers a circular storm forming and *then* moving forward, *i. e.* remaining stationary, or nearly so, at first. We do not know if the dust-whirlwinds, so common in hot climates, and water spouts are generated by the same causes, and subject to the same laws, but both these phenomena certainly do what I have here supposed the storm (or storms) to do, that is, many of them are stationary or nearly so while forming, and then to use Bruce's words " stalk forward."

We now return to the consideration of the Northernmost of the two tracks which I have laid down, or that of the *Emerald Isle* and *Halifax Packet's* storm.

The *Halifax Packet* was by her log at noon on the 30th in lat. 21° 18′ long. 88° 40′ which I have marked; but there is no datum of any sort to show where she was at noon on the 1st, and I have thus laid down her place on the 2d only, when the hurricane having dismasted her had passed on, leaving the wind at South with her at noon.

The wind is not marked during the ten hours from midnight; viz. from 2 A. M., when the Barometer had fallen to 27.90, to noon; but as it was veering from N. N. E. to a gale at East on the preceding day, we may take it to have been in its highest fury, veering from E. S. E. to S. E., and eventually to South, as it passed on; which agrees, as will be seen with her track, as her position between 2 A. M. and noon should lie a little to the S. E. of where it is *at noon*, as she must have been drifting to the N. West, both with the wind and with the storm wave.

The *Emerald Isle's* log describes a very rapidly approaching storm, of which, says Capt. Scales, "the squalls rose in the S. E. quarter, but struck us about East." This is an exact description of a circular storm travelling upon a track to pass to the Southward of the vessel, and perhaps, if we may use the expression, "throwing off" squalls from its periphery. By 5 A. M. on the 2d, the wind was about E. S. E., "increasing with fearful rapidity, blowing heaviest from S. E." which in fact was the time at which he was nearest to the centre, and ending, as it should do, at South when it had passed on. At Cuttack they had by noon on the 2d an increasing gale North and N. N. E.; by 4 P. M. strong gale North,* with furious squalls, and this continuing with little variations till 3 A. M. of the 3d, when a lull took place, followed by a change to E S. E. and S. E. The strength of the gale, says Dr. Minto, was from noon till sun-set of the 2d, while it was moderating with the ships as before remarked.

Having thus described, briefly, the weather experienced on these two tracks, it may be useful to shew by a comparative table, that they *could not* be the same storm; for at first sight, one is inclined to take them as such, and the fact of two severe hurricanes at once, of small diameters travelling with great rapidity on nearly *parallel* lines is a new acquisition to our storm knowledge, and will serve perhaps not only in future to explain many phænomena which are not now well understood, but to guide the perplexed seaman with comparative safety, as I shall in the sequel shew. It is evident, however, that our first care is to prove, that the phænomena about which we reason did really occur. We have already shewn this, and I think with a tolerable degree of certainty; but the negative proof will also greatly assist our views. Not forgetting my remarks on the *Eliza's* position as possibly twenty miles too far to the South, let us now see how the ships *Eliza, Halifax Packet,* and *Emerald Isle,* were situated during their storms; what were the winds and weather they had; and what were those that they *ought* to have had if they were all in the same storm; and to the ships we will also add the winds and weather at Cuttack and Pooree, beginning from midnight between the 1st and 2nd October, which is the earliest time at which it was felt by the *Eliza.*

The *Eliza* at this time was about in latitude 18° 30′, longitude 89°, and the storm had then fully begun with her from the N. N. E.

Now if all the Ships were in one storm,—

	Should have had the wind about	But had it about
The *Halifax Packet* bearing from the *Eliza* about N. N. W., distance 40 miles, ...	N. E. by N.	E. S. E.

* While it was veering to South, and *at* South, with the *Emerald Isle* and *Halifax Packet*, moderating from S. S. E. with the *Eliza*, and shifting at 6 P. M. at Pooree!

	Should have had the wind about	But had it about
The *Emerald Isle* bearing from the *Eliza* about N. N. W. 130 miles,	N. E. by N.	E. by S.
*At Pooree, distance 200 miles, E. N. E. from the *Eliza*, ...	N. N. E.	North.
*At Cuttack, distance 210 miles, N. E. by E. from the *Eliza*,......	N. E. by N.	North.

At Noon on the 2d, or 12 hours later, we find that the centre of *a* storm had just passed the *Eliza,* which vessel was then about in latitude 17° 45′ N., longitude 88° 48′ E. Now at this time, the *Eliza* had the wind at S. S. E. blowing a hurricane.

And the other ships, if the storm were the same, should have had the winds as follows:—

	Should have had the wind about	But had it about
Halifax Packet bearing from the *Eliza* North a little Westerly, 105 miles, ...	Due East full hurricane.	South. hurricane abating.
Emerald Isle bearing from the *Eliza* NbW. 145 miles, ...	East full hurricane.	S. E. full hurricane.
At Pooree bearing from the *Eliza* about N. W. miles,............	N. E.	North.
At Cuttack bearing from the *Eliza* about NWbN. miles, ...	NEbE.	NbE.

These two statements will, I think, sufficiently demonstrate, that the storms were not the same; and it will be seen on examination, that the supposition of *two* storms explains all the anomalies satisfactorily.

A few words more on this subject will, however, I think dissipate any doubts. I have already remarked, page 801-802, on the rate at which the *Eliza's* storm travelled to Pooree from the undoubted station of its centre at noon of the 2nd.

Now as the shift of wind from North to E. S. E. took place, as we have seen, at Pooree at 6 P. M. of the 2nd, we should naturally look to find that, if the storms were the same, the wind at Cuttack, which is fifty miles to the North of it, veered also in such a way as to coincide with this change; or at all events, (as it was on shore,) *nearly* so. But we find on the contrary, that this did *not* take place at all; and that at

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* These two stations and the ship *Emerald Isle*, may be considered as not at this time within the limits of the storm.

Cuttack it was 6 hours later, or A. M. of the 3rd that they had a lull and the wind veering subsequently from N. and N. N. E. at midnight of the 2nd, to S. E. at 6 A. M. on the 3rd.

The supposition then here is, that as 39 miles per hour is so very high a rate of travelling, this Cuttack storm was that of the *Eliza,* of which the rate of travelling would then be reduced to 18.3 miles per hour, the distance from the place of the centre of the *Eliza's* storm on the 2nd to Cuttack being 220 miles, and the time from Noon 2nd to A. M. 3rd, say 12 hours.

But if we look at the Charts, we shall see that, had it been the case that this Cuttack storm was the same hurricane, it must have passed within a short distance of the *Emerald Isle,* (50 miles, if we have rightly estimated her position,) and still closer to the *Halifax Packet,* and that it must have been, taking it to have moved through equal spaces in equal times, nearest to the *Emerald Isle,* at about 7 P. M. of the 2nd, when she should consequently have had the hurricane in full force. This, however, is *not* the case, for by her log it is plain, that the hardest part of the gale was *over* by 6 P. M., when the wind had veered to South; whereas on our supposition, it would have been a furious hurricane at S. E., and the same, with a little variation as to time holds good for the *Halifax Packet's* storm. These vessels' logs then will not admit of our considering the Cuttack storm as the principal, or the only one, and there is moreover another obstacle to our so doing; viz. that while the Pooree storm, which in fury is described by Dr. Cumberland, who saw both, as one-eighth more violent than that of 1840,* seems, to use a familiar word, "naturally" that of the *Eliza;* that of Cuttack was but a smart gale blowing down a few trees. As to the diameters of these storms, Mr. Redfield remarks, that his storm track No. VIII, of 1835, was probably not more than 100 miles in diameter, and the Coringa hurricane of 1839 certainly contracted to about 150 miles in diameter, while it increased in fury. It will then be asked, "As what we are to consider this Cuttack storm?" I should say decidedly, that as shewn in my Seventh Memoir, it is another of those cases in which a violent hurricane coming up from seaward, with a strong monsoon blowing nearly at right angles to its track† divides into smaller storms, and no doubt the various repulsions to which a storm travelling at this high rate must have been subjected from the effects of the high land may have contributed to this effect, and that the Cuttack storm, like that of Midnapore in 1842, was a separate storm from that of Pooree, and I have thus marked it—the reader will judge if with sufficient warrant. The diminution of force may be accounted for partly, I think, by the vicinity of the Balasore Hills to Cuttack breaking up by their resistance the Northern half of it,* and partly from the interference of the two storms as they approached the land. The extreme suddenness of their approach, and severity of their effects while they lasted, sufficiently account for the dreadful losses to which I have alluded. It might also be made an additional argument for the uses of, and attention to Simpiesometers and Barometers. We have no traces of these storms inland to the Southward or South Westward in the Goomsoor country, where are situated the wild tribes of Khoonds, and to the Northward and North Westward, where the country between Sumbulpore and Balasore is almost as little known.† For these parts then our knowledge ends hereabouts.

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* See Third Memoir, Vol. ix p. 1021 and 1022, Journal of the Asiatic Society.

† Which we see by the logs of the *Essex* and *Lion* was the case.

The next trace we have of any storm inland is at Purulia, and here again the question arises, if this was either the Cuttack or Pooree storms, or an independent vortex. The distance from Cuttack to Purulia is in a direct line, measured on the Post Office map 240 miles, and the bearing NbE., and from Pooree 290 miles. The change of wind took place at Pooree, as we have seen, at about 6 P. M. of the 2d, and at Cuttack about 6 A. M. on the 3d. The abatement of the Purulia storm took place also in the afternoon at Purulia, so that as far as we can ascertain from this Memorandum, we may take the centre of the storm, which if it was a rotatory one, passed to the Eastward of the station, to have been nearest the station at 10 A. M. on the 3rd. Now from 6 P. M. of the 2nd to 10 A. M. of the 3rd, is 16 hours of *time* between Pooree and Purulia, and from 6 A. M. of the

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* See Mr. Bond's report from Balasore.

† The European reader unacquainted with India, will be surprised to hear this of districts only 200 and 300 miles from the metropolis of British India; but it is a fact that the very *names* of some of the Khoond tribes in Goomsoor have only become known to us since the war of 1836! and that there are still thereabouts sects and tribes of which we know indeed the names, but nothing more!

3rd to 10 A. M. of the same day, is 4 hours of *time* between Cuttack and Purulia. The first interval, of 16 hours, with the distance 290 miles, gives about 19 miles an hour for the rate of travelling; and the second interval of 4 hours with 250 miles of distance, gives 62 miles an hour! It seems then, that as far as time and distance go, taking into account the retardation which sea storms experience when they reach the land, it is *more* probable, or rather it is *quite possible*, that the Purulia gale may have been the Pooree hurricane, and that there is no possibility or probability that the Cuttack storm was so, for we know of no rate approaching to 62 miles per hour. All this is, however, but vague and unsatisfactory, but I am unwilling to leave any thing unexamined. We have seen so frequently instances of storms either forcing their way far inland, or being apparently lifted up by high lands and renewing themselves again at considerable distances, that we can only venture to state and weigh the probabilities without pronouncing dogmatically upon the connexion or non-connexion of the various storms when they appear to have some relationship. There are, however, two more circumstances to be stated, which must not be omitted, the one is that the retardation is in favour of the probability, that the storms were the same; and the other, that we may easily suppose the Pooree storm to have been turned off to the Northward by the ranges of hills behind that station. Mr. Bond's report from Balasore it will be seen distinctly points out the spur of the Balasore Neelghiris at Choramon, as the dividing line between the heavy storm at Pooree and the breeze at Balasore, Choramon being about 100 miles N. W. of Pooree and 60 N. W. of Cuttack, with the great valley of the Mahanuddee river between them; and vallies seem certainly to influence in various ways the tracks of storms.

We have next to attend to the reports from the various stations to the Northward and Westward of Purulia; viz. Gya, Patna, Pussewa and Allahabad, at which it is clear, that they had parts of, and at Patna the centre of a rotatory storm passing on the 6th and 7th. The first question which naturally occurs is again the same which we have already discussed, "*Was this the same storm as that at Pooree or a different one?* I find it difficult to pronounce whether it was or was not, from the absence of documents by which it might be traced between Pooree and Gya. At Purulia indeed, there was certainly as we have seen *a* storm, and this apparently part of a rotatory one, and possibly that of Pooree, if it travelled 19 miles an hour. We have, as before said, no other intervening documents, so we are compelled to suppose either that the Pooree storm was, as clearly shewn in the case of the Calcutta storm of June,* lifted up by the ranges of hills, and did not descend again till it reached Purulia and Gya; or else it was a new storm, perhaps generated about Purulia, and travelling North and North-westerly. I have so marked it on the chart, but merely for the sake of connection, and by no means as affirming what it was; for the Purulia gale might have been quite an independent one. Beginning then at Gya, it will be found, that this place bears about N. by W. from Pooree, distance 390 miles. Now the centre of the Pooree strom passed that place at 6 P. M. of the 2nd October, and the centre of the Gya storm we may take to have passed that station at 6 A. M. on the 5th. From 6 P. M. of the 2nd to 6 A. M. of the 5th are 60 hours, which for a distance of 390 miles, gives 6.5 miles an hour, while the rate of the Pooree storm we find to have been 36 miles per hour at sea, and 19 miles on shore, which is a second retardation of rate so far beyond what we have hitherto seen, that it is much in favour of its being an independent storm. The track from Pooree to Gya it may be remarked, is however, analogous to those of the Calcutta storms of June 1842. Leaving out the strong S. Easterly breeze experienced by Mr. Peacock on the Bhagiretty, as, at most, a distant effect of some of these storms, we may commence on the 5th October, where we find that

At Gya, there was,.......	From 6 A. M. gale from S. E., furious at midnight, and lasting till 8 A. M. on the 6th.
At Patna, ...	Falling Barometer, rain and increasing gale from the East till midnight.
At Pussewa, latitude 25° 41′. longitude 83°03′ distant about 168′ N. W. by W. of Gya,....................	Barometer sunk 0.25 from the 3rd instant. P M. high wind East and N. E. increasing to gale, with violent gusts at North by daylight of 6th.
At Allahabad, latitude 25° 27′, longitude 81° 50′ E., ..	By 8 P. M. on 4th, strong gusts and showers had increased to a gale East and E. N. E. At 8 A. M. 5th very strong, moderating and increasing again at midnight to a strong gale.

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* See Seventh Memoir, Jour. As. Soc. Vol. xi, p. 1089.

Agra, ...	Unusual winds from the Eastward and Simpiesometer falling.

On the 6th October.

At Gya, ...	At 8 A. M. S. E. gale *veering** to S. W. and blowing till noon, when it moderated.
At Patna, ...	From midnight furious gale, blowing down trees. Noon Barometer had fallen from 29.81 on the 4th to 29.54, wind shifted to South, time not marked. At 5 P. M. to the West, blowing furiously till midnight.
At Pussewa, ...	Gale from North, violent gusts to Noon, when N. N. W. and Barometer beginning to rise, veering to N. W. and finally to West; but only a strong breeze by 3 P. M.
At Allahabad, ...	Gale continuing from East and E. N. E. till daylight, when moderating and veering to N. E. North, and finally West.

Allowing for the numerous disturbing causes which inland storms meet with, and for the general nature of the observations, it will be found that the circles I have marked on the chart shew the variations which are described in the winds as the storm travelled up to the North and by East, (the first instance of a storm track, trending to the *East* of the meridian,) from the neighbourhood of Gya, and passing not far from Patna and between it and Pussewa; though it might perhaps have been better placed about half way between both? But the word "shift," used in Mr. Ravenshaw's report from Patna, inclines me to believe, that the change was, if not a sudden, a very rapid one, whereas that at Pussewa was evidently a *veering* from North at 7 A. M. to N. N. W. at Noon, and N. W. at 1 P. M. or 4 points in 6 hours. Beyond Patna we have no farther trace of the storm.

I should thus be inclined to take this storm as quite a separate one. I have already remarked on and discussed the rates of travelling of the various storms, and no farther observations occur to me, except to remark on the very high rates of travelling, which the *Eliza's* log and

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* "Veering" and not "shifting;" and the careful use of these words is important; for the *sudden* shift, particularly with an interval of calm, indicates the passage of the central portion of a gale; the "veering" that it has passed *near* the spot.

Pooree report furnish us, which are as yet new in the Eastern Seas, and the remarkable confirmation of the fact of the dangerous Westerly set of 3 or 4 miles per hour prevailing at the Sand Heads, even when as in this case, the nearest centre of the nearest storm was at least 100 miles distant from the Light Vessels!

P.S.—I obtain, just as this sheet goes to press, two more documents. The abstract of the log of the Ship *Seringapatam,* Capt. Robertson, and the notes taken at Purulia, which Capt. Hannyngton had mislaid. The memorandum from the *Seringapatam* is as follows; she was bound to Madras:—

1st October, 1842.—Nautical Time

Course and Distance	Lat. and Long Noon	Bar.	Ther.
S. S. W.	19° 26′ N. 86° 36′ E	29 60	83°

Wind and weather variable S. W., N. W., and S. E, with thunder and rain.

2nd Oct—S. S. W. 180. | 17° 39′ 84° 32′ | 29·50 83°

N W. strong breeze throughout.

This position it will be seen places the *Seringapatam* on nearly the same meridian as the *Essex,* but about 30 miles further to the Northward at Noon on the 2nd, and about 15 miles nearer to the track of the centre of the Pooree hurricane, as I have laid it down. Her Barometer is accordingly lower, and she had the N. W. breeze, (it would have been a *gale* had she been a degree less advanced on her track,) "a steady" one throughout, which is what *ought* to have occurred with her.

The following is the tabular statement of the storm at Purulia, as sent me by Capt. Hannyngton:—

Meteorological Register kept at Purulia, during the Storm of the 2nd and 3rd of October, 1843, *by Captain* G. C. ARMSTRONG, 49*th Native Infantry.*

Date.	Hour.	Barometer at Purulia.	Barometer reduced to the level of Calcutta.	Thermometer.		Direction of wind.	REMARKS.
				Attached.	Detached.		
2nd October,	8 P. M.	28·94	29.62	80½	78	E.	Strong breeze, increasing. Scud low, and driving fast.
Ditto, ...	10 P. M.	,,	,,	,,	,,	E.b.S.	Gusty, with alternate lulls.
Ditto, ...	11 P. M.	28·90	29·58	,,	,,	,,	Fresh gale, a little rain.
3rd October,	2 A. M.	,,	,,	,,	,,	,,	Ditto, more continuous, with occasional violent gusts.
Ditto, ...	5 A. M.	28·92	29·60	80	77	E.S.E.	Ditto, moderating a little, heavy rain since 3 A. M.
Ditto, ...	8 A. M.	28·94	29·62	,,	,,	E.	Fresh breeze, clearing up and moderating.
Ditto, ...	10 A. M.	28.96	29·64	80	77½	,,	Breeze, moderating and abating.
Ditto, ...	Noon.	,,	,,	,,	,,	,,	Light airs, heavy rain with lightning and thunder.

J. HANNYNGTON, *Principal Assistant.*

Maubhoom Division, Principal Assistant's Office, Purulia, the 11*th November,* 1842.

This document shews that, as I have supposed at p. 810, the Purulia storm, if it was any part of a circular one, was doubtless an independent one, both as regards those to the Southward and to the N. W. of that station, the little change indicating that it was, if circular, passing on nearly an East and West track to the South of Purulia.

H. P.

Notes on a curious species of Tiger or Jaguar, killed near the Snowy Range, north of Darjeeling. By Lieut. TICKELL, *Bengal Native Infantry, Assistant Agent to the Governor General, S. W. Frontier.*

The animal from which these notes are taken was killed by a Bhotia, near the Snowy Range, in the northerly part of Sikkim, and its skin subsequently purchased by a gentleman who obligingly lent it to me for the purpose of sketching. The want of a better model to copy from, has probably rendered my drawing, with regard to outline, faulty in many points. But careful measurements, protracted on a scale, may give a tolerable approximation to true proportions and general aspect, and the markings of the skin are faithfully delineated, as well as the color of the fur carefully described.

Dimensions of the Skin.

	Feet.	*Inches.*
From nose to root of tail, ...	3	5
Tail, ...	2	10½
Centre of back, between the shoulders to sole of fore-paw, ...	2	0½
From root of tail to sole of hind paw, ..	2	1¾
,, nose to eye, ...	0	4½
,, eye to ear, ...	0	5½
,, ear to between shoulders, ..	0	8

Of the breadths of various parts I take no measure, for they are in places shrunk, and in others pulled out during the operation of flaying. The head is narrow and nose somewhat elongated, the muzzle approaching the attenuated form in some of the smaller cats, leading into "Viverrina." Limbs and body bulky and low, and the tail very thick, long and furry. The hair on other parts is thick and soft, but shorter

of its innocuous habits, of its feeding almost entirely on birds, (caught in trees!) and on the poultry of the villagers, and of its becoming readily and permanently tame after capture.

The Lepchas here call the animal "Pungmar," and the Bhotias "Zik;" their accounts are widely different to the above They describe it as an uncommonly fierce and wary animal, difficult to approach, and dangerous to attack, from its invariably turning on the assailant if wounded. It is a rarer animal than the "Sejjiak" or Leopard; but it is to be found in the vallies lying north of Darjeeling, in dense jungle, chiefly by the banks of rivers; the Ranget, Roongnoo, &c. affecting low places in preference to mountain tops. It approaches the villages of the Bhotias and Lepchas sometimes, and kills goats, pigs, &c.; of its predeliction for poultry, nothing is said by them; and of its propensity to climb trees, I could gather nothing satisfactory. The Lepchas affirm that it has been seen on trees, but that it ascends them *in play*, and not to seek food. Indeed the notion of such a large animal catching birds on trees, appears ridiculous. Altogether the accounts as received by me, of the "Pungmar" tally more with the description (as to disposition) of Felis Nebulosus, the "Rimau Maug" of the Sumatrans, as cursorily given in the work above referred to.

M Stanislas Julien on the Study of the Chinese Language. Translated for the Journal of the Asiatic Society. By HENRY PIDDINGTON, *Sub-Secretary, Asiatic Society.*

The Asiatic Society has just received from its author M. Stanislas Julien, a work entitled "*Exercises Pratiques d'Analyse de Syntax et de Lexigraphie Chinoise,*" of which the subject is a critical examination of thirteen lines of a translation of a notice in the work of the Chinese traveller and author Hiouen-tsang upon India, by M. Pauthier.

In this translation, M. Stanislas Julien detects ninety-four faults in thirteen lines! and his criticism is approved by the first Chinese scholars of England, Germany and Russia. His work is dedicated to his friend, Mr. Morrison. With this controversy we have nothing further to do than that it may serve to put us a little on our guard as to what some Chinese translations *may* be;* but the introduction to M. Julien's paper is so remarkable, as containing the opinions of a first rate Chinese scholar and a man of letters, highly distinguished in other walks, on the study of the Chinese language, that I have thought it well worth translation; since at the present time, nothing which can encourage or facilitate the study of this language is indifferent to us, independent of its high interest in a mere philological point of view. This introduction I find, also appeared with his first controversial paper in the *Journal Asiatique*, for May 1841, but it is reprinted with the present pamphlet.

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* As for instance, some which were copied from the Canton Register into the Calcutta papers about a year or more ago, in which, in a single proclamation, half a dozen common English, and I believe some Latin quotations were inserted, and this we were gravely told, was a translation from a Chinese State Paper.—H. P.

"The time is now happily far distant since it was generally believed in Europe, that the study of the Chinese language required, even in China, the whole life of a man of letters. M. Remusat has greatly contributed by his works and his teaching to destroy this prejudice, and if some men of learning yet give credit to it, it is because they have not taken the trouble to examine the question. This opinion would indeed be well-founded, if to speak, read, and write Chinese it were necessary to learn the forty-two thousand characters, which compose the great Dictionary, published in thirty-two octavo volumes by the emperor Khang-hi; for certainly not a single Chinese man of letters would be found capable of such a prodigious effort of memory. But it is as useless for a Chinese, or a European to know, and to be able to write all the characters of the *Khangi-hi-toen-tien*, (Khang-hi's Dictionary,) as for a foreigner studying our language to be acquainted with all the words of the French Dictionary of Boiste, which in mere words is three times as rich. Supposing that the most complete of our Dictionaries contains, as is said, a hundred and twenty-four thousand words, we may say without fear of contradiction, that a foreigner who knows only three or four thousand, would be able to read the majority of French authors. More than a hundred thousand words, or terms, are relative to sciences, arts and trades, and which seldom occur in literary works. When the reader meets with them, he looks for them in a good Dictionary, and continues his reading without fancying that he does not understand French because he is unacquainted with some choice scientific or technological terms.

The case is exactly the same with the Chinese Dictionaries. The Emperor Khang-hi's would be reduced from forty-two thousand to six or eight thousand words,* if we were to subtract from it about ten thousand variations of ancient and obsolete characters, of names of men, of places, of mountains, and of rivers, and of the terms belonging to sciences and art.†

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* Several with no meaning, Marshman's Introductory Remarks, p. 31.

† 1900 characters form the materials of the language, Marshman, p. 37.

Under the *Han* dynasty, says the author of the Vocabulary of the *Kings*, candidates for the offices of historians of the empire were required to know at least nine thousand different characters. Now, as the complete annals of any epoch must comprise, in methodical order, almost every subject of literature and science, it would appear from this alone, that the number of characters which the most learned men were required to know, differs prodigiously from that which many persons in Europe suppose necessary for the lowest literary grades.

We may indeed suppose, that these last hardly require more than five or six thousand words to speak, read, and write Chinese. In fact, the four classic books do not contain more than two thousand and four hundred characters; but nevertheless, a person who has carefully studied them, and who is at the same time master of the principles of Chinese syntax *(construction,)* can understand without assistance almost all books of history, geography, and philosophy. In China the candidates for the literary rank of Kiu-jin, (Licentiate,) are only required to have well studied the four classic books, and any one of the *Kings* (canonical books,) which they may choose.

From what has been said, the study of the Chinese language does not require, as far as relates to the necessary words, more trouble than any foreign language; such as German for instance, which is commenced without any fear, and with a certainty of mastering it.* But the difficulty in the study of Chinese does not consist in the number of words. It is well known, that this language is a monosyllabic one, and that its words do not allow of inflexions indicating in substantives and adjectives genders, numbers and cases, and in verbs, times and persons. Moreover, the same word sometimes changes its value in changing its place, and becomes a substantive and adjective; a passive active, or neuter verb or adverb. The word *chew* for example, may signify good (substantive,) good (adjective,) esteem good (approve,) and good adverbially taken; when the mechanism of the Chinese language is understood this word is as explicit in its different positions as the Latin words *bonum, bonus, bonum judicare, bené.*

The English language has some similarity to this. Certain substantives by their position, and by the words which accompany them, become sometimes adjectives, verbs, and adverbs, without the least difficulty arising thereform to the reader or hearer. Thus the word *cut*, is an adjective in "a *cut* wig," and a verb in "to *cut* timber."

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* See also Marshman's Introductory Remarks, p. 3.

The word present (a gift) is an adjective in "the *present* season," and a verb in "to *present* a man."*

The word *head* is an adjective in "the *head* workman," and a verb in "to *head* the people."

In Chinese, the word *cheou* (head,) may become, according to circumstances, adjective or verb, or an adverb.† The English word "*pen*" is a verb in "to *pen*," (write,) a letter.

The Chinese word *pi* (pencil) has the same scope; it may signify, according to its position, "*pencil*," and "to write with a pencil."

It follows then, that to understand Chinese, it is not sufficient to be acquainted with a great number of words. Although the nine thousand words formerly required to become one of the historians of the empire should be perfectly known by heart, this alone would not suffice to understand half a page of the easiest Chinese text.

To be able to give to each word the value resulting from its position, and to catch the varying sense of the prepositions and particles,‡ which determine the reciprocal relation of words, the language must be studied systematically; the student must have analysed, and I might say *dissected*, philosophically, the best translated works by the Missionaries, or by the learned of Europe, who have taken them for guides. He will then be able to distinguish with certainty, the positional values *(valeurs de position,)* upon which the knowledge of the Chinese language mostly depends. In this respect its difficulties are of a peculiar kind; but not greater nor more numerous than those of other languages of the East or of Asia. We have seen many persons, who after some years of study and application, have been able to read, translate or analyse with all desirable exactitude, ancient or modern Chinese works relating to their studies. I may name M. Bazin, senior, who has given to the learned world a first volume of Chinese Dramas, completely translated in prose and verse, and who is now about to publish the complete translation of a celebrated Drama in twenty-four acts.* M. Theodore Pavie, who had studied Sanscrit and Chinese at the same time, acquired in a few years a remarkable knowledge of these two languages, and to him we owe a volume of Chinese Novels, not less distinguished by the elegance of their style, than by the fidelity of the translation; and M. Biot, junior, whose early studies and a solid knowledge of the Chinese language, have enabled him to examine, with much advantage to science, books written in the ancient dialect, and relative to the history, geography, statistics, or arts of China. The readers of the *Journal Asiatique* have often had occasion to appreciate the Memoirs with which he has enriched its pages. He is now preparing for the press the Alphabetic Concordance of the names of Chinese towns of the first, second, and third rank, which have been changed under different dynasties. This will reflect new honour on the author, and new light upon our knowledge. I might add to these names, those of M. Leon Pages, Advocate, who has just concluded a French translation of the four classic books *(Kings)* with a running commentary, and of his cousin, M. Edmé Mechain, (grandson of the astronomer,) lost to science by an early death when Vice-Consul at Smyrna. M. Mechain had learnt Chinese when a law student, and only at his leisure hours, and yet in three years he was able to read with facility. Son of a Consul General, and pursuing that profession, he hoped to become one day French Consul in China, and that his knowledge of the languages of the celestial empire might be of use to our commerce, our arts, and our literature. His name as a Chinese scholar would be still unknown, were it not that I have felt it a duty to mention here his zeal and his remarkable acquirements in Chinese.

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* Our English readers will observe, that M. Julien has here forgotten the pronunciation which makes a different word of it. He probably alludes here to the mere spelling, which to the eye of a Chinese, as to that of a child, makes it the same word as the substantive.

† Examples from Marshman, p. 195.

‡ Marshman alludes to prepositive characters to mark the cases of nouns, and again, p. 994, "every termination is supplied by position."

It is thus a well established fact, both from the examples which I have quoted, and from a sort of public notoriety, that in a few years a tolerable knowledge of Chinese may be acquired. But there is *one indispensable condition,* which is to study with care the laws of construction, the fixed principles which determine the grammatical functions of the words and modify their value according to the place in which they stand in the sentence; the value of the prepositions which are sometimes significative as in other languages, and sometimes lose their usual meanings, becoming purely phonetic marks of regimen, as have I believe demonstrated in the dissertation at the close of my Sinico-Latin edition of the works of the Chinese philosopher *Meng-tseu.* If these rules, which are for Sinologists what those of inflexion are in other languages, and which are their best guides in interpreting a passage, be neglected, the Chinese language may be studied for many years without ever acquiring the degree of knowledge necessary to become a faithful translator."

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* This Drama, entitled " *Pi-Pa-ki,* or the History of the Lute," was published in 1841, by Dupont.

Proceedings of the Asiatic Society.

(Monday Evening, the 4th September, 1843.)

The regular monthly meeting of the Society was held at the rooms on Monday the 4th September, at the usual hour. The Honorable the President in the chair.

The following Members proposed at the August meeting were ballotted for, and declared duly elected. The usual communication was ordered to be made to them :—

Major W. Anderson, B. H. A.; F. Mouat, Esq. M. D., B. M. S.; and Capt. Stephen, B. N. I., A. D. C. to the Honorable the Deputy Governor.

And the following new Member was proposed :—

Dr. Sprenger, B. M. S. proposed by the Honorable Sir H. Seton, seconded by Mr. H. Piddington.

The following list of Books, presented and purchased, was read :—

Books received for the Meeting of the Asiatic Society, on the 4th September, 1843.

The Oriental Christian Spectator, second series. Bombay, August 1843, vol. iv, No. 8.—Presented by the Editor.

Journal of the Bombay Branch of the Royal Asiatic Society. Bombay, April 1843, No. 5.—Presented by the Society.

Journal Asiatique, 3me série, tome xix. Juillet à October 1842. Nos, 76 à 78, Paris.—Presented by the Society.

Jamieson's Edinburgh New Philosophical Journal, Edinburgh, 1843, vol. xxiv, No. 67.—Presented by the Author.

Proceedings of the Geological Society of London, 1842, vol. iii, part ii, No. 91. —Presented by the Society.

Proceedings of the Academy of Natural Sciences of Philadelphia, for August, September and October 1842, Nos. 17, 18, and 19.—From the Academy, (two copies.)

London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science, third series, London, January 1843, vol. xxii. Nos. 141 and 142.

Transactions of the Royal Astronomical Society, London, 1842-43, vols. xii, xiii, and xiv.—From the Astronomical Society.

Early Records in Equity. Calcutta, 1842.—Presented by the Hon'ble Sir H. W. Seton.

Calendars of the Proceedings in Chancery in the reign of Queen Elizabeth. —Presented by the Hon'ble Sir H. W. Seton.

Bulletin de la Société de Géographie, 2me série, Paris 1842, tome xvii.

Naturalist's Library.—Ornithology, vol. xiv, Nectariniadæ, or Sun-Birds. Edinburgh, 1843.—From the Booksellers.

Pauthier, Réponse a l'Examen Critique, Paris, 1842.—Presented by the Author.

Pauthier, Examen Méthodique des faits qui concernent Le Thian-Tchu ou L'Inde, Paris, 1840.—Presented by the Author.

Pauthier, Vindiciæ Sinicæ. Dernier Réponse à M. S. Julien, Paris 1842.—Presented by the Author.

Bopp, Vergleichende Grammatik des Sanskrit, Zend, Griechischen, &c. &c. Berlin, 1842, Vierte Abtheilung.—Presented by the Author.

The Secretary read the following Memoranda :—

1. It has been suggested by several Members, and the Secretary begs now to mention it, that the works of reference belonging to the Library of Fort William, which as a temporary arrangement were made over to the Public Library, might more appropriately be deposited in that of the Society, and this with more advantage to the public in general.

2. Government having requested a further supply of fifty copies of the Scinde Vocabulary, these have been sent from the copies placed for sale with the Booksellers. The copies for sale at Bombay have been sent to Messrs. Collett and Co.

3. It has been suggested to Government, that at the present time a reprint of Lieut. Leech's Grammar and Praxis, &c. of the Brahoee, Beloochee and Punjabee languages, which forms about 61 pp. of the 7th vol. of the Journal would be most useful with reference to our new acquisitions in the West of India. In consequence of this, a reprint has been sanctioned, and is now in progress at Bishop's College Press.

With reference to the first of these Memoranda, it was ordered, that the Secretary be requested to inquire into and state to the Committee of Papers, what were the conditions under which the works in question were deposited in the Public Library, and to frame thereupon an application for them in terms of his suggestion.

The Secretary farther reminded the Society, that two works from Messrs. Ostell, *i. e.* Cuvier's Mammifères, and Swainson's Illustrations, had remained for inspection, and that some Nos. of Smith's Zoology of Southern Africa had also been sent for inspection by a private individual, who was desirous of disposing of them. Some conversation took place, when it was agreed upon, that the purchase of Cuvier should be farther considered, with reference to the possibility of obtaining a copy cheaper from Europe. The Honorable the President begged to be allowed to present to the Society, Swainson's Illustrations, and Dr. Smith's Zoology of Southern Africa in testimony of his high appreciation of the indefatigable labours of Mr. Blyth in the Zoological Department, and his desire to assist and forward them. The best thanks of the Society were voted for this very liberal donation.

The following note from the Librarian, addressed to the Secretary, was read:—

To H. TORRENS, *Esq. Secretary, Asiatic Society.*

SIR,—I have the honour to forward to you the enclosed note of Mr. J. Thomason's, who desires me to bring to your notice, that some papers, published by the Royal Asiatic Society and the Bombay Branch Society are not in our Library.

The papers alluded to, are contained in the Transactions of the R. A. S. and the Journal of the B. B. S., and with regard to these publications I beg to state, that we have received only the first three volumes of the Transactions of the R. A. S.,* and there are only a few numbers of the above-mentioned Journal in our Library.

As these publications are most intimately connected with the progress of Oriental learning, I beg leave to propose, that they should be procured for the Library.

23rd August, 1843. Your most obedient servant,

E. ROER.

It was ordered, that the works alluded to be completed for the Library.

Read the following letter, accompanying a valuable donation of rare Books by the Honorable Sir H. Seton, for which the thanks of the Society were voted:—

To the Secretary of the Asiatic Society.

SIR,—As it appears by the Catalogue lately published, that the Library of the Society, among the works published by the Record Commission, does not contain the Calendars of the Proceedings in Chancery in the Reign of Elizabeth, I beg to present it with a copy of them, together with an unpublished Tract relating to their contents. I have the honor to be, &c.

Calcutta, *24th August*, 1843. H. W. SETON.

Read the following letter from the Under-Secretary to the Government of Bengal, sanctioning an allowance of Co's. Rupees 64 per mensem, for the expenses of the Museum of Economic Geology:—

No. 842.

From Under-Secretary to the Government of Bengal to H. TORRENS, *Esq. Vice-President and Secretary, Asiatic Society.*

SIR,—With reference to the second paragraph of my letter, No. 691, of the 3rd instant, I am directed to inform you, that the Honorable the Deputy Governor of Bengal, with the concurrence of the Government of India, is pleased to sanction the monthly sum of Co's. Rs. 64, for establishment and contingencies of the Museum of Economic Geology. I have the honor to be, Sir,

Your most obedient servant,

Fort William, *31st July* 1843. A. TURNBULL,

Under-Secretary to the Government of Bengal.

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* The Transactions of the R. A. S. are now published in the form of a Journal, which the Library possesses.

Read the following extract of a letter from Dr. Wise, B. M. S. to the Sub-Secretary, dated Dundee, 29th June, 1843.

I was hurried across Egypt in such a manner as prevented me from delivering the box of Books in person to Mohammud Alee, which the Asiatic Society, at your kind suggestion, charged me with. I sent it to the palace of Grand Cairo, and requested the British Consul and Clot Bey to see that it was delivered in a suitable manner. This I am sure they did, and to my great regret it was all I could do, as the Padsha was in Upper Egypt when I was at Cairo. After all the preparations I had made, the steam boat was not able to land our party at Cosseir on account of the weather, and I therefore came to England with the same mail I had come from India with.

Read letter from M. Delessert, returning thanks for the honor conferred on him by his election at the August meeting.

Read the following letter from Messrs. W. and H. Allen, the Society's Booksellers and Agents in London :—

HENRY PIDDINGTON, Esq.

SIR,—We have the pleasure to send you, as Secretary to the Asiatic Society, our account to this date. We enclose the particulars of £43 : 16 : 4, against the Society for money paid, and books supplied by us. The account current annexed herewith gives credit for the publications of the Society sold during the year, which leaves a balance of £13 : 18 : 3, due to us.

We have hitherto been instructed to keep the account for the sales of the Journal separately, and the enclosed statement for the sales amounts to £32 : 12 : 0. The two accounts shewn, together, leave a balance of £18 : 18 : 9 in favor of the Society, and we leave you to determine the mode of settlement. We shall be most happy to honor your draft at 30 days' sight for either of the balances. If you draw for £32 : 17 : 0, then the Society will be indebted to us the balance of the account current.

We have the honor to be, Sir,
Your most obedient servants,

London, 30th June, 1843

W H. ALLEN and Co.

DR. *The Asiatic Society Calcutta, in Account with William H. Allen and Co.* CR.

30th June 1843.—To paid sundry charges on Books received to forward, &c. including £21 : 0: 0 paid to the Oriental Fund, as per statement enclosed,..	£ 43	16	4	30th June 1842,—By Balance stated, ...	£ 1	14	9
				30th June 1843.—Account sales as per statement herewith,	28	3	4
				By Balance,............	13	18	3
	£ 43	16	4		£ 43	16	4
To Balance, ...	£ 13	18	3				

London, 30th June, 1843

E. E
W. H. ALLEN AND Co.

Dr. *The Secretary of the Asiatic Society, Calcutta, in Account with*
Wm. H. Allen & Co. Cr.

	On hand, June 30, 1842.	Received since.	On hand, June 30, 1843.	Sold.	Per Copy.			
Journal, No. 97, ...	11	...	8	3	2-9	0	8	3
,, ,, 98, ...	11	...	7	4	...	0	11	0
,, ,, 99, ...	14	...	12	2	...	0	5	6
,, ,, 100, ...	12	...	11	1	...	0	2	9
,, ,, 101, ...	10	...	9	1	...	0	2	9
,, ,, 102, ...	13	...	11	2	...	0	5	6
,, ,, 103, ...	12	...	9	3	...	0	8	3
,, ,, 104, ...	10	...	7	3	...	0	8	3
,, ,, 105, ...	11	...	8	3	...	0	8	3
,, ,, 106, ...	11	...	8	3	...	0	8	3
,, ,, 107, ...	11	...	11	3	...	0	8	3
,, ,, 108, ...	13	...	11	2	...	0	5	6
,, ,, 109, ...	14	...	9	5	...	0	13	9
,, ,, 110, ...	16	...	12	4	...	0	11	0
,, ,, 111, ...	17	...	12	5	...	0	13	9
,, ,, 112, ...	16	...	11	5	...	0	13	9
,, ,, 113, ...	15	...	11	4	...	0	11	0
,, ,, 114, ...	15	...	11	4	...	0	11	0
,, ,, 115, ...	16	...	12	4	...	0	11	0
,, ,, 116, ...	17	...	13	4	...	0	11	0
,, ,, 117, ...	16	...	12	4	...	0	11	0
,, ,, 118, ...	...	25	*2 10	13	...	1	15	9
,, ,, 119, ...	...	50	*13 10	27	...	3	14	3
,, ,, 120, ...	...	50	*13 13	21	...	3	6	0
,, ,, 121, ...	...	50	*13 14	23	...	3	3	3
,, ,, 122, ...	...	50	*13 15	22	...	3	0	6
,, ,, 123, ...	...	50	*13 17	20	...	2	15	0
,, ,, 124, ...	...	50	*13 16	21	...	2	17	9
,, ,, 125, ...	...	70	*13 36	21	...	2	17	9
,, ,, 126, ...	...	50	*13 18	19	...	2	12	3
,, ,, 127, ...	...	50	*13 18	19	...	2	12	3
,, ,, 128, ...	...	50	*13 23	14	...	1	18	6
						40	3	0
Paid Sundry Advertising, Porterage, Booking, &c.					3 5 8			
Commission 10 per Cent....					4 0 4			
						7	6	0
						£32	17	0

E. E.

London, 30th June, 1843. Wm. H. Allen and Co.

* These figures are the number of copies distributed as per list below

Distributed.

1 Copy No. 18, to Royal Society, Edinburgh.
1 ,, No. 18, to Professor Schlegel.

2

1 Each, No. 119 to 128, to Professor Wilson.
1 ,, ,, Ed. Asiatic Journal.
1 ,, ,, Royal Society.
1 ,, ,, Royal Asiatic Society
1 ,, ,, Ed. Edinburgh Philosophical Journal.
1 ,, ,, Royal Institution.
1 ,, ,, Ed Philosophical Magazine.
1 ,, ,, Athenæum,
1 ,, ,, Baron Von Hammer Purgstall.
1 ,, ,, University of Bonn.
1 ,, ,, Royal Society of Edinburgh.
1 ,, ,, Ed. Spectator,
1 ,, ,, Professor Schlegel

13

The Asiatic Society, Calcutta, in Account with

Dr. Wm. H. Allen and Co. **Cr.**

		On hand June 30, 1842.	Recd. since.	On hand June 30, 1843.	Sold.	Per Copy.			
Asiatic Researches, vol. 15, 4to. stitched,	...	19	...	19	...	24	0	0	0
Ditto, ... vol. 16, ...	...	10	...	9	1	...	1	4	0
Ditto, ... vol. 18, part 1, ...	...	7	...	5	2	12	1	4	0
Ditto, ... vol. 18, part 2, ...	...	10	...	8	2	...	1	4	0
Ditto, Index to first 18 vols. ...	...	21	...	20	1	...	0	12	0
Ditto, ... vol. 19, part 1, ...	...	34	...	31	*2	...	1	4	0
Ditto, ... vol. 19, part 2, ...	..	42	...	38	*3	...	1	16	0
Ditto, ... vol. 20, part 1, ...	...	33	...	29	*3	...	1	16	0
Ditto, ... vol 20, part 2, ...	...	40	...	37	*2	...	1	4	0
Amis ul Musharahin, 4to. stitched, ...	...	3	...	3	...	...	0	0	0
Futawa Alemgiri, vol. 1, royal 4to. ...	...	2	...	1	1	24	1	4	0
Ditto, ... vol. 2, ...	...	2	...	1	1	...	1	4	0
Ditto, ... vol 3, ...	...	4	...	3	1	...	1	4	0
Ditto, ... vol. 4, ...	...	5	...	4	1	...	1	4	0
Ditto, ... vol. 5, ...	...	1	...	...	1	...	1	4	0
Ditto, ... vol. 6, ...	...	1	...	...	1	...	1	4	0
Inayah, ... vol. 3, 4to. ...	...	1	...	1	...	...	0	0	0
Ditto, ... vol. 4, 4to. ...	...	33	...	32	1	...	1	4	0
Jawame ul Ilm ul Riazi, 4to. stitched,..	...	1	...	...	1	...	0	7	2
Kifayah, ... vol. 3, 4to. ...	...	7	...	6	1	...	1	4	0
Ditto, ... vol. 4, 4to. ...	...	6	...	5	1	...	1	4	0
Mahabharata, ... vol. 1, royal, ...	...	8	...	6	2	...	2	8	0
Ditto, ... vol. 2, ...	...	11	...	8	3	...	3	12	0
Ditto, ... vol. 3, ...	...	14	...	11	3	...	3	12	0
Ditto, ... vol. 4, ...	...	1	...	...	1	...	1	4	0
Index to Mahabharata, 4 parts, ...	...	...	20	20	...	...	0	0	0
Ditto, ... part. 4, ...	...	...	20	20	...	...	0	0	0
Naishadha Charita, 8vo. stitched, ...	...	4	...	3	1	17	0	12	0
Raja Tarangini, complete in 1 vol. royal 4to. stitched, ...	... ...	22	...	21	1	20	1	0	0 0
Susruta, vol. 2, 8vo. ditto, ...	...	3	...	2	1	7-2	0	7	2
Tibetan Dictionary, 4to. ditto, ...	...	6	...	5	1	20	1	0	0
							35	2	4

Boarding 1 Copy of the Asiatic Researches, vol. 16, ...	0 1 10	
Paid Entry Duty and Wharf charges on Index to Mahabharata, per Ellenborough, ...	2 5 0	
Paid Sundry, Advertising to this date, ...	2 17 0	
Commission 5 per Cent.	1 15 2	
		6 19 0
		£28 3 4

* Asiatic Researches, vol. 19, part 1,
Ditto, vol. 19, part 2,
Ditto, vol. 20, part 1,
Ditto, vol. 20, part 2,
} Sent to Royal Library, Berlin, per order of Professor Wilson, July 3, 1842.

Wm. H. Allen and Co.

DR. *Asiatic Society, Calcutta, to* **W. H. ALLEN AND CO.** *London.* **CR.**

1842.							
July 6,	Per Owen Glendower.—Cuvier and Valenciennes, Histoire des Poissons, tome 16, 8vo. stitched and Plates, 421 to 455, £	2	2	0			
	Journal des Savants, May,	0	0	0			
	Shipping Expences, &c.	0	2	0			
					2	4	0
„ 30,	Per Agincourt.—Journal Asiatique, 7 Nos. enclosed,	0	0	0			
	Paid Duty on ditto,	0	2	6			
	Journal des Savants, June,	0	0	0			
	8vo. Parcel received to forward from Royal Geographical Society,	0	0	0			
	8vo. Parcel ditto from Geographical Society,	0	0	0			
	Shipping Expences, &c.	0	1	6			
					0	4	0
Aug. 31,	Per Prince of Wales.—Journal des Savants, July,	0	0	0			
	8vo. Parcel received from Society of Arts enclosed,	0	0	0			
	Shipping Expences, &c.	0	1	0			
					0	1	0
Sept. 30,	Per Windsor.—Journal des Savants, August,	0	0	0			
	8vo. Parcel received from Paris, and paid duty on the same,	0	4	6			
	Shipping Expences, &c.	0	1	6			
					0	6	0
Nov. 19,	Per Zenobia.—Journal des Savants, September,	0	0	0			
	Royal 8vo. Parcel received to forward from Oriental Translation Fd.	0	0	0			
	8vo. Parcel from Geological Society,	0	0	0			
	Shipping Expences, &c.	0	2	0			
					0	2	0
Dec. 23,	Per Stag.—Journal des Savants, October,	0	0	0			
	Niebuhr's History of Rome, vol. 3, 8vo. calf gilt,	1	2	0			
	8vo. Pamphlet from Geological Society enclosed,	0	0	0			
	Antiquitates Americanæ, 1837, C. C. Rafer, imp. 4to. bound,	0	0	0			
	Shipping Expences, &c.	0	3	0			
1843.					1	5	0
Jan. 25,	Per Carnatic.—Received to forward,						
	Bulletin de la Societe Geographie, vol. 17, 8vo.	0	0	0			
	Paid Duty on the same,	0	1	0			
	8vo. Parcel received from Paris,	0	0	0			
	Paid Duty on ditto,	0	3	0			
	8vo. Pamphlet from Geological Society,	0	0	0			
	Jameson's Journal, No. 67,	0	0	0			
	Bopp, Vergleichende Grammatik, 4to. stitched,	0	0	0			
	Paid Duty on ditto,	0	1	6			
	Shipping Expences, &c	0	2	0			
					0	7	6
Mar. 23,	Per Patriot Queen.—Journal des Savants, November and December 1842, and January 1843,	0	0	0			
	Paid Subscription on Journal des Savants, January to Dec. 1843,	2	18	0			
	Received to forward, Julien Simple Exposé, &c. 8vo. stitched,	0	0	0			
	Received to forward.						
	Paid Duty on Julien Simple Exposé, &c. 8vo. stitched,	0	1	6			
	Tassy, Chapitre Inconnu du Coran, 8vo. stitched,	0	0	0			
	Shipping Expences, &c.	0	4	0			
					3	3	6
May 18,	Per Seringapatam.—J. E. Gray, Spicolegia Zoologica, part 1, royal 4to. stitched,	0	7	0			
	Leach's Zoological Miscellany, colored, 3 vols. Royal 8vo. cloth, lettered,	4	13	0			
	G. R. Gray's List of the Genera of Birds with their Synonymes, 2nd Edition, 8vo. cloth,	0	9	0			
	Bibliotheque de M. Silvestre de Sacy, liv 1, 8vo. stitched, and de Delhi a Bombay, par Roberts, and paid Duty on ditto,	0	2	6			
	Journal Asiatique, January and February, and paid Duty on ditto,	0	1	0			
	Transactions of the Geological Society, vol. 6, part 2, 4to. stitched,.	0	0	0			
	Journal des Savants, February and March,	0	0	0			
	Report of the British Association for 1842, 8vo. bound,	0	0	0			
	Edinburgh Philosophical Journal, No. 68,	0	0	0			
	Philosophical Magazine, April and May,	0	0	0			
	Two Royal 8vo. Packets from the London Electrical Society,	0	0	0			
	Saadi, par Garcin de Tassy, 8vo. stitched,	0	0	0			
	Shipping Expences, &c.	0	12	0			
					6	4	6
	Paid Subscription to Rafer's Antiquitates Americanæ, 1837, 4to. bound, sent per "Stag," 23d December 1842,				3	0	0
	Paid Subscription to Oriental Fund, for 1842 and 1843, two years,..				21	0	0
June 12,	Sundries per Essex.—As per Invoice stated,				4	15	0
„ 30,	Sundry Postages to this date,				1	3	10
	WM. H. ALLEN AND CO.				£43	16	4

And the following draft of reply to them was also read and approved of:—

Messrs. W. H. Allen and Co., *London.*

Dear Sirs,—By the July mail, I have the pleasure to acknowledge the receipt of your letters of the 17th and 30th June last, to the address of Mr. Piddington.

I note that the Marble Bust of the late James Prinsep, Esq. sent to you by Professor Wilson, to be forwarded to the Society has been shipped per ship "*Essex;*" on the arrival of the vessel, the Bust will be landed per bill of lading you forward.

The several statements of accounts forwarded with your letter of the 30th June last, have been found correct and in order; and although the Society is not disposed at present to disturb the account current closed to the 30th June 1843, by a balance against the Society of £13 : 8 : 3; yet I am desired to say, that it is susceptible of readjustment with reference to my letter of the 16th February,* as regards the cost and charges of £18 : 10 : 0, for a copy of Arrowsmith's Map of India, forwarded by you per ship "*Persian,*" which has been rejected by the Society as incomplete, and in consequence useless for the purpose for which the Map was commissioned from England. You have been already advised, that the Map has been made over to Messrs. Thacker and Co., to be disposed of on your account.

The property in the Journal from No. 133, is now vested in the Society; but you will continue to keep its sale account separate as heretofore, furnishing as usual, your Account Current distinct from that of the Society's other transactions with you; my interest, however ceases from No. 132, and you will therefore render up to that number a separate account to me.

The sum of £32 : 17 : 0, being for sale proceeds of the Journal up to No. 128, transferred to the Society's general Account Current with you, has been adjusted here at the exchange of 1s. 11*d.* per Rupee in Co's Rs. 342 : 12 : 6, the rate of exchange, London on Calcutta, ruling on the 30th June. I am dear Sirs,

Your faithfully,

H. Torrens,

Vice President and Secy. As. Socy.

Asiatic Society's Rooms, Calcutta,
5th September, 1843.

Read the following letter from the Secretary to the Bombay Branch of the Royal Asiatic Society:—

To the Secretary to the Asiatic Society of Bengal, Calcutta.

Sir,—By desire of the Bombay Branch of the Royal Asiatic Society, I beg to enclose bill of lading of a case of Geological Specimens addressed to "Curators of the Museum of Economic Geology of India," shipped on board the "*Fazal Rubany,*" Capt. Stewart. I shall forward a list of the Specimens, together with such remarks as may be required, with the duplicate of the bill of lading. Freight has been paid here. I have the honor to be, Sir,

Your most obedient servant,

John G. Malcolmson,

Secretary B. B. R. A. S.

Bombay, Asiatic Society's Rooms,
5th August, 1843.

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* Not yet dispatched with reference to this paragraph.

The Curator stated that the box would be landed in the course of the following day.

Read the following extract of a letter from Professor Wilson to the Sub-Secretary, dated 5th May, and brought out by Dr. Sprenger, who being present, was introduced to the Society by the Honorable the President:—

To H. PIDDINGTON, ESQ., *Secretary, Asiatic Society.*

DEAR SIR,—I have requested Dr. Sprenger, who comes out in the Company's Medical Service, to take charge of the following Books for the Society :—

Sama Veda, Text.
Ditto, Translation.
Megha Duta, new edition.
Selections from the Mahabharata.

The two former I send on behalf of the Oriental Text Society, and the Orienta Translation Fund Committee—the two last upon my own. Yours truly,

East India House, 5th May, 1843. H. H. WILSON.

Read the following from Prince Ghaulam Mahommed, accompanying a clay bust made by a native artist:—

E. BLYTH, ESQ. *Curator, Asiatic Society, &c.*

SIR,—I beg you will present to the Society, with my best respects, the accompanying Bust of their late President, the Honorable H. T. Prinsep, Esq. as a small token of my esteem of the public worth of the individual whom it represents, and I trust the Society will do me the honor of accepting it as the offering of their most sincere well-wisher. I remain, Sir,

Russapuglah, 23rd August, 1843. Your obedient servant,
GHUALAM MOHUMED, PRINCE.

Read the following letter from the Secretary to the Agricultural and Horticultural Society of India :—

H. TORRENS, ESQ. *Secretary, Asiatic Society.*

DEAR SIR,—As I believe, under the present system of publication, there is no objection to an interchange of the Journal of the Asiatic Society with those of other bodies, I beg on behalf of the Committee of Papers to state, that the Agricultural Society will be happy to exchange Journals with your Society. The interchange can commence with the Journals of the respective Societies from the beginning of the current year, should this proposal be acceded to.

I am, dear Sir,
Your's faithfully,
JAMES HUME,
Honorary Secretary.

Agricultural Society's Room,
Town Hall, August 17, 1843.

The proposed exchange was agreed upon.

Read the following extract of a letter from Dr. Spilsbury to the Sub-Secretary, relative to the Mammoth Head brought down by Lieutenant Hickey :—

My dear Sir,—I really have been quite horrified at the announcement in the Journal, (No. 136, or 50 N. S.) received last night of the Head from your *zealous contributor.* The history of that Head is as follows, and the Society at present have no more right to it than I have. It was exhumed at Brimhan Ghat, by the late Capt. M. Smith, then in charge of the Saugor district, (vide Journal, vol. viii. for 1839, p. 951 and its foot note.) He carried it to Saugor where I saw it, and where he gave it to me ; I then gave it to Cautley (for comparison, as I had sent a very large one previously to the Society,) and offered to convey it to Agra, which I did, and here all trace was lost for a long time. I could get no answer about it from Dr. Woodburn, the Garrison Surgeon, and it must have lain two years in his compound, not at Kamptee as you state. When H. with his Corps went from Saugor to Agra, I requested him to make enquiries, and let me know, which he did, stating, that it was all safe in W's. compound, of which I informed Cautley, who requested me when opportunity offered to send it to Calcutta, care of Cantor and Co. When H. was leaving Agra for Barrackpore, he asked me if he should take this Head in his boat, and which I gladly availed myself. About this time Cantor's house failed, and there was therefore no use in sending it to them, and it remained with H. pending Cautley's *hookum.* I shall write to Cautley to-morrow, and see what he says. I hope you duly received my remittance of 20th ultimo.

Benares, 15*th August,* 1843.

Read the following extract of Letter from Lieutenant Hutton :—

My dear Sir,—I have the pleasure to announce the dispatch per Banghy to your address, of a small packet containing specimens for analysis of the wax or wax-like substance deposited on the leaves of a tree growing above Rajpore, by the larvæ or "*Flata limbata,*" an insect closely allied to F. Nigricornis, a figure of which you will find in Donovan's Insects of China. The specimens of wax I should feel obliged by your analysing, and adding the results in a note to my remarks. There are likewise two specimens of the perfect insect in a little box which can be added to the Society's Museum after inspection. Can you tell me whether the Society possess any specimens of ores and minerals which they would exchange for any duplicates I may have of Minerals, &c. from Afghanistan and parts of India? Also, whether they have any duplicate insects for exchange? All of course in good condition. I wish much I could furnish you with the localities from which your Himalayan collection sent down by me, was presented; but my memoranda were destroyed during my absence in Afghanistan, and I cannot tell what you have received. Could you tell me what you had received together with the numbering of the specimens, I might perhaps tell, from my geological report and the aid of my own specimens, where yours are from.

I will in a day or two remit you the amount of my subscription, which is due for two or three quarters, I fancy.

Yours very truly,

J. Hutton,

M. A. S.

Mussoorce, 23*rd August,* 1843

Read an application from L. Wray, Esq. requesting the Society's patronage of a work now publishing by him, under the title of "The Sugar Planter's Companion." It was considered by most of the members that this subject was so peculiarly within the province of the Agricultural Society's pursuits, that it might be better left wholly to that body.

Read the following letter from Captain Tickell to the Secretary :—

MY DEAR TORRENS,—I have the pleasure to send you a sketch of a curious kind of Tiger, made from a skin obligingly lent me by Lieutenant Biddulph, one of the residents here. The sketch and notes thereon I should wish to have published in the Journal, if they be thought worthy. And when they are done with I beg they may be returned to me, for I have no copy by me for my own collection. I hope this can be managed without trouble. S. R. TICKELL.

Darjeeling, 11th August, 1843.

P.S.—When opportunity offers, I wish you would express my apologies to Mr. Piddington for my not having answered his note, about the skulls of the different tribes in my part of India. It reached me but an hour or two before I started for Darjeeling, and what with sickness and travelling, I have had no opportunity for replying to him. I doubt whether skulls could be procured in Singbhoom, as they are there exceedingly jealous about their dead, and burn the bodies to ashes, bones and all.

A lithographic proof of the drawing, which had been already prepared for the Journal, was exhibited, and as the work of a native artist, its extreme fidelity was much admired.

Read the following extract of Letter from Dr. Campbell, Resident at Darjeeling.

H. PIDDINGTON, ESQ. *Secretary, Asiatic Society.*

I have sent you by to-day's Banghy, specimens* of the Rock Salt of Eastern Thibet, which is brought here for sale by the Thibetans through the passes in the snowy range leading into Sikim. I may forward a note of particulars regarding this article at some future time. When purified by solution for recrystallisation, it is snowy white, and far superior for the table to the Indian salt. The price here at present is 5 seers per rupee. Yours truly,

Darjeeling, 7th August, 1843. A. CAMPBELL.

Read the following Letter from Capt. Hannington, addressed to the Sub-Secretary :—

H. PIDDINGTON, ESQ., *Secretary to the Asiatic Society.*

MY DEAR SIR,—In the Journal of the Asiatic Society, No. 65, for May 1837, there is an article by Mr. H. T. Prinsep, on the mortality among members of the Civil Service. The table prepared by him, is from its extreme accuracy very valuable; but it would be still more so if brought up to the present time according to the method he has pointed out. It is indeed probable, that the register has been kept up, but I do not know by whom, or where to apply for information respecting it.

I therefore take the liberty to ask your aid in procuring it. I am prosecuting some inquiries of this nature, and the results if worth any thing, would be much at your service for publication in the Journal. If the Table can be obtained, I would put it into such form as would render it available for determining the expectation of life, and the values of annuities.

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* No. 1. The red coloured salt.
,, 2. The white crystals found in the former in the proportion of 5 per cent.
,, 3. Bits of minerals found in the salt.

Knowing your zeal in these matters, I need not apologize for the trouble I am giving you.

Yours very faithfully,

Purulia, 21st August, 1843. J. HANNINGTON.

The Sub-Secretary stated, that he had already addressed Mr. Charles Prinsep, who had pointed out various sources of probable information; others were suggested by the meeting, and amongst them the Honorable the President mentioned the information procured, and printed by a Committee of which Major Henderson was Secretary, and himself a member, of which the object was to found a Life Assurance Society for the benefit of the Civil Service, which had been printed in the Transactions.

Read the following Letter from B. H. Hodgson, Esq. Resident at Kathmandoo, accompanying a Catalogue of Nepal Birds, &c. :—

MY DEAR SIR,—I hope you have before this got my six boxes of specimens sent by Steamer, care of Messrs. Carrier and Co. Patna, also the tin box sent by Dak a few days ago.

The enclosed exhibits the whole arranged in the modern genera, and is by far the vastest Catalogue yet produced of Indian Birds. I wish Mr. Blyth to compare it with the specimens and then to publish it; after which the *whole* of the specimens and catalogues are to be sent home by my Agents, Colvin and Co., addressed to B. Hodgson, Esq. Longport, Canterbury. I have corrected the catalogue so far as I have time, and deem it sufficiently correct now to appear, but wish Mr. Blyth's prior revision.

Yours very truly,

Nepal, 22nd August, 1843. B. H. HODGSON.

Read the following Letter and enclosed Reports from Capt. D. Williams, Assistant Commissioner at Arracan :—

MY DEAR SIR,—The Soogree, or Head Revenue Officer on the island of "Reguing" or "Flat Island" has just made a report, of which the enclosed is a translation, that on the 26th, 27th, 28th and 29th of last month, a Volcano broke out in the sea a little distance South of "False Island," and a new island was formed.

On reference to a chart of Arracan, you will see that "False Island" is East of "Flat Island," and the latter is South of "Round Island," whence I obtained the copper ore I lately sent to the Asiatic Society; the group is situated on the S. E. shore of the island of Chedooba. I consider the subject of sufficient interest to report on to the Society, especially as regards its vicinity to the island where the copper ore was found.

Your's truly,

Ramree, August 9, 1843. D. WILLIAMS.

P.S.—I have sent for specimens of the soil of the new formation.

Translation of a Report from Mungtee of Regwain.

Mungtee, an inhabitant of the Purgunnah of Regwain, represents that on the south of the island of Joyghoyá-een, which is situated within his jurisdiction, there arose at a distance of about thirty bamboos a new island, where from the 19th to the 22d Wachloo,* of the Mughee year 1205, there appeared of a sudden a fire (supernatural fire.) Considering this as a subject of importance, the petitioner brings the same to the notice of Hozoor.

ترجمه مگهی

رنگیون پرگنه کاسوکري غلام مسمے منگتے نے خداوند کا جناب علي میں عرض پهونچاتا هی

غلام کا علاقه جي گیوائیں زنجیره کا دکهن طرف اندازي ۳۰ تیس بانس کا تفاوت میں نیا زنجیره هوکے سنه ۱۲۰۵ مگهے واچلو مهنا کے اونیس ۱۹ تاریخ سے لغایت مهنا مذکور کا بائیس ۲۲ تاریخ تک ناگاني آگهه اوتهایا هی اسي واسطے غلام نے اسبات اپنا اوپر واجب جانکر کے حضور میں اطلاع کرتا هوں اسمیں خاوند مالک هیں *.

ترجمه کیا گوکل چندر داس بندوا محرر نے ملک هوائیں محرر کے ساتهه

It was proposed and carried unanimously, that the Secretary be requested to draw up for the approval of the Society, a representation to Government, setting forth the great scientific and other advantages which might be derived, were a qualified person deputed to examine and report upon the singular and highly interesting phenomena adverted to in Capt. Williams' communication; inasmuch as some account of the Volcano would be most eagerly looked for by the scientific world at home, and its proximity to us would render neglect on the part of the Society most inexcusable, and indeed disgraceful.

The Curator Museum Economic Geology and of the Geological and Mineralogical Department, stated, that ill health for the last month had prevented his drawing up his report; but he begged to read part of it, being a report on a reference from Government relative to a newly discovered Sulphur bed, at Kurachee in Scinde, as follows :—

No. 32 of 1843.

From Captain J. PREEDY, *Collector and Magistrate, Kurrachee, to Captain* C. J. BROWN, *Commissioner in Scinde, Hyderabad.*

SIR,—I have the honor to report for your information, that I have discovered an apparently extensive bed or mine of Sulphur in the vicinity of Ghizree Bundur. My attention was first drawn to the spot by the native agent, Nao Mull, who pointed out to me on the surface of the ground a considerable quantity of sulphureous matter, which on fire being applied, immediately ignited. I have since had the upper surface of the earth removed in one or two places, and have by this day's post transmitted a small specimen of the Sulphur found within about a foot of the surface. As the mine is within two hundred yards of the Ghizree Creek, the Sulphur can be transported by water at a very little expence, and should it prove as productive as I have reason to expect, it will be a most valuable discovery. A great quantity of Nitre is apparent on the surface of the ground near the Sulphur mine, and this also might be turned to account.

---

* A certain Mughee month.

I have, &c.

Kurrachee Collector's Office,
21st June, 1843.

(Signed) J. Preedy, *Capt.*
Collr. and Magt. Kurrachee.

(True Copy,)
(Signed) C. J. Brown,
Commissioner in Scinde.

To H. Torrens, Esq., *Secretary, Asiatic Society.*

Sir,—In reply to a reference to the Museum of Economic Geology from Mr. Secretary Thomason, accompanying a small specimen of Sulphur sent from Kurachee, by Captain J. Preedy, I have the honor to Report as follows:—

1. The specimen in question was unfortunately so very minute in quantity, that nothing but approximate notions of the real value of the mineral can be formed. The whole weight did not much exceed 20 grains, of which 10 grains were taken for experiment.

2. Heated in a porcelain capsule, the 10 grains left a residuum of 4 of a fine dark coloured carbonaceous-looking ash.

3. It was not worth while to examine this small residuum, since if it contains any thing of value, which is but barely probable, we shall better be able to ascertain it when we obtain larger supplies of the mineral.

4. Approximately, then we may say, that the specimen contains about six-tenths, or 60 per cent. of sulphur, probably of tolerable purity, though a larger quantity will be required to decide upon this point, as also if the residuum contains any thing worth looking after. I solicit the attention of Captain Preedy, to whom I presume a copy of this Report will be sent, to the following remarks and suggestions.

5. I assume from his account that there is plenty of it, and thus do not advert to the *quantity* of the mineral.

A. The question as to the value of sulphur, depends mainly on its purity. The common sulphurs, manufactured or produced from copper or iron pyrites, are all contaminated by impurities, such as arsenic, selenium, and the like, which render them wholly useless in many branches of the arts, and the high value of the pure Sicilian sulphur, about which it will be remembered we were two years ago on the point of going to war, depends on its purity. The deposits from which these are procured are like this which I suppose ours to be, *i. e.* alluvial, and have no known and direct connection with volcanic action.

B. Your beds or layer of sulphur may be some pure and some impure. We should be glad to be furnished with at least half a pound of each sort as far as you can penetrate, with some of the earthy matrix in which it lies. Specimens of the minerals (as gypsum, &c.) found with it, and specimens of the intervening beds, if there are any such. Also of the nitrous efflorescence on the surface.

C. If you can also oblige us with accounts of the surrounding rocks or soil with specimens, it will add much to the value of the information. In short, a good account of the sulphur field or ground, with specimens, is a great desideratum.

D. You may in the mean time establish a little sulphur manufactory with only a few common earthenware pots and water spouts, as follows:—*

Prepare a common water jar by coating it over outside with a little wet mud, to which a small quantity of lime and cow-dung has been added.

Set this jar sloping in an earthen furnace, with two earthen supports for it, the side to lean on the front wall and the mouth to be outside, the fire to be put in at the back. Two inches of space at most, should be left to allow the fire to play a little round the belly of the jar, but remember that no great heat is required; all that is wanted is to distil over the sulphur at a gentle heat; a strong heat will both burn it to waste, and by making it grey, lower its price. If your heat is well managed, you will get pure, bright, sulphur-yellow produce. Fill it with the mineral broken to lumps not exceeding the size of a walnut.

E. Over the top of the jar, put the head as shewn in the sketch which is only another earthen pot with an earthenware water spout fixed into it, the end of which is also fixed into a smaller jar in the bottom of which is a hole of about one inch in diameter. The spout should be supported by a forked stick.

F. The jar is placed (supported by a bamboo frame,) over a tub of water; the whole of the joints of the apparatus are to be kept tight by plastering mud and cow-dung, and winding a few strips of coarse cloth or gunny smeared with it about them.

G. The whole arrangement is, it will be seen, nearly that of the native distillers; but the difference when at work is, that the head and pipe are allowed to remain warm, the object being to sublime over the sulphur in vapour from the jar and condense it, when it flows in a melted state through the hole at the bottom: as very little heat is required, the fire place need not be more than eight inches below the belly of the jar.

H. In the water a square wooden mould, of say six or eight inches cube, with sides *tied together* may be placed. As the melted sulphur flows in, it will fill this and probably adhere, so as to form a cubic block which is a highly favorable shape for stowage. It should be remarked, that the roll-shaped sulphur is that of the common impure sulphurs, and this, if ours is pure, would spoil its sale (say at home?) by giving it a bad look. If a mark of any kind be left *in relief* on the bottom of the mould-box, it will appear stamped on the block of sulphur. You may, if your sulphur runs freely, receive it into an iron or earthen pan with handles, and pour it at once into the mould which should be wetted.

I need not add in conclusion, that I have here described an apparatus of materials to be found all over India, and as there are potters in every town, they can in a few days make you more convenient apparatus; as for instance, a still-head with a pipe curving downwards. It is probable that the people, seeing a valuable product obtained so easily by means so quickly within their reach, will be happy to share the produce with Government, or rent the ground; but it should not be forgotten, that after chemical purity, cleanliness is of first rate importance to the value of the drug. I shall be happy to hear of the progress of the experiment, and by the way I may say, that there are even simpler means of obtaining sulphur than this which I have given; but judging from the minute sample sent, they would not give *clean* sulphur without care and management, so I do not trouble your with them.

When you have succeeded in distilling sulphur well with one jar, you may make a double apparatus, by having two on opposite sides over the same fire, and end by having five or six in a row, as in Europe.

Yours truly,

Museum, 22d August, 1843. H. PIDDINGTON.

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* A sketch was sent with this Report, but as it only represents the common *Sooree's* apparatus, we have not thought it worth while to give a plate of it —EDS.

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JOURNAL

OF THE

ASIATIC SOCIETY.

Tables of Comparative Philology, shewing specimens of the affinity of the Greek, Latin and English Languages, with the Sanskrit, Persian, Russian, Gaelic, Welsh, Lithuanian, German, Hebrew, and Anglo-Saxon. By the Rev. James Long.

The following Comparative Tables of the Indo-European languages are the result of much labour and research during the last four years. Having myself, when studying the German, Dutch, Italian, Spanish and Portuguese languages, experienced the advantages accruing from giving attention to the affiliation of languages as a guide to the acquisition of them, I hope the same principle may be of use in facilitating among Europeans, a knowledge of the Sanskrit and Persian, and also that natives of India might with greater ease familiarise themselves with the leading European languages. The Bengali and Hindi tongues, as derived chiefly from the Sanskrit, must have a number of words of common origin with the English, which is connected with the Indo-Germanic languages. Steam is now increasing the intercourse between nations very rapidly, and binding the whole human race together as members of one great family, but the diversity of languages is a mighty antagonistic power. Those tables have been compiled with the design of rendering philological studies more interesting, as well as more *scientific*, and of smoothing the way to an acquaintance with different languages so necessary in the present day for religious, literary, and commercial purposes.

The rules I have laid down for my guidance in selecting words for those Comparative Tables, are,

1. To insert no word except on the *authority* of standard Philological works, as "Bopp's Vergleichende Grammatik," or Comparative Grammar of the Sanskrit, Greek, Latin, Lithuanian, Sclavonian, Gothic and German languages; "Eichhoff's Parallele des langues de l'Europe et de l'Inde;" "Vans Kennedy's Researches into the origin and affinity of the principal languages of Europe and Asia;" "Prichard's Eastern origin of the Celtic nations;" and many other publications.

2. Those words are considered as *cognate,* which are similar, or nearly similar in sound and meaning. Though sometimes the significations be not precisely the same, yet the difference is only such as might arise from a natural connection of ideas. Thus "the Sanskrit *kúma,* a lake, and *κυμα,* a wave; *stoma* the head and *στομα,* the mouth; *balam,* an army, and *bellum,* war, are clearly identical terms." As no two nations ever had exactly the same alphabetical and grammatical systems, it is evident that words in passing from one into the other, must have undergone some change in their consonants and vowels. Sir W. Jones himself, who was a very cautious Etymologist, has observed: "We know, *a posteriori,* that both *fitz* and *hijo,* by the nature of two several dialects, are derived from *filius;* that *uncle* comes from *avus:* and *stranger* from *extra;* that *jour* is deducible, through the Italian, from *dies;* and *rossignol* from *luscinia.*" Etymological studies have been fixed on a firm basis by the Germans, and are conducted on ascertained principles. The great philological law by which modern Etymologists are guided, is, that no permutation of letters is allowed arbitrarily, it must be sanctioned by the usage and genius of the languages compared. Sir I. Newton, by applying the principles of the inductive philosophy to the material world, disclosed the arcana of nature's laws. Cuvier acted on the same system in his researches into Comparative Anatomy; and Bopp has succeeded equally well by grounding his rules for Comparative Philology on the broad basis of groups of languages. Who would suppose at first sight, that *stranger* is connected Etymologically with the Greek εκ; here is the inductive process; with εκ, εξ is cognate, then the Latin *ex, extra, extraneus,* the old French *estranger,* modern French *etranger,* and English *stranger.* The French *eveque* and English *Bishop* have not one letter the same, yet they are both acknowledged to be derived from the Greek επισκοπος.

3. I allow in the tables of those languages being *cognate* which have, in addition to an analogy in grammatical forms, a large number of original words expressive of the most *natural* and *simple* ideas, terms for family relations and the objects of visible nature, and verbal roots of the most frequent occurrence. This excludes all those words which commercial or literary intercourse might introduce.

4. Words, which in their primary signification denoted the properties of objects of sense, are applied to express the analogous mental qualities. Thus the words, a *sanguinary* man and a man of *sanguine* temperament are both derived from *sanguis*, blood. They are sometimes restricted in meaning; thus *rector* in Latin signifies a ruler, but in England it is limited to a clergyman of a certain official dignity, and in Scotland to the head-master of a classical school. *Corps* in Latin, signifies the body, the English words derived from it are—corpse, a dead body; corps—a body of soldiers;—corporation, a municipal body. We use *villain* in the sense of a wicked person, formerly it meant only a villager.

The languages of which I have given *specimens* for comparison in those tables belong to the Indo-European class, and have been spoken in a range of country extending from the Indian Ocean to the Atlantic, and from Ceylon to Iceland. The chief branches, are,

1. The *Persian*, denoted by (P); its primitive form was the Zend, the sacred language of the Magi, adopted by Zoroaster, and spoken by the ancient Persians; the Pehlvi, a cognate tongue, was spoken by the Medes and Parthians. Persian is incorporated very largely into Urdu.

2. The *Hebrew*, denoted by (H); the notion is now exploded that this was the parent language. Its cognates are Arabic, denoted by (A), Syriac, Chaldee and Phenician.

3. The *German*, denoted by (G); the Dutch bears a close affinity with German.

4. The *Gaelic*, denoted by (Ga); it is cognate with the Erse or Irish.

5. The *Welsh*, denoted by (W)

6. The *Cymraig*, denoted by (C); it is cognate with the Welsh, Cornish, and Armoric, and belongs to the Celtic family.

7. The *Russian*, denoted by (R); it differs little from the Sclavonic, which is the ecclesiastical language of Russia.

8. The *Lithuanian,* denoted by (Li); it is of Sclavonian origin, and is still spoken in Courland and Lithuania. The ancient Prussian is a dialect of it.

9. The *Anglo-Saxon,* denoted by (S); it was the ancient language of England, and forms the basis of the English tongue.

10. The *Latin,* denoted by (L); the French, Spanish, Portuguese, Italian, and part of the English language are derived from it.

11. The *French,* denoted by (F); on account of its general spread, language is mentioned here.

12. The *Gothic,* denoted by (Go). This language was in constant use for probably 1500 years, as the tongue of the rude and widely dispersed tribes that inhabited Thrace and Germany.

13. The *Arabic* denoted by (A); few words are inserted, as many were the same as the Persian.

14. The *Greek,* expressed by its own character.

15. The *English* known by being printed in Italics.

16. The *Sanskrit.*

No word is inserted in those tables which is not cognate with the Sanskrit, which is used as the common centre for all; hence many words, which are cognate with the Sanskrit, but not with either the Latin, Greek or English, are omitted. The field is wide, every year will add to the discoveries and improvements made in the science of Comparative Philology. The old system of etymological investigation, which limited the field of observation to one or two languages, is now abandoned. The discovery of the Sanskrit language has quite altered the mode and form of etymological researches. These tables collect in *alphabetical* order, (so as to facilitate reference,) what is scattered in *many scarce* and *expensive* works. I hope they may tend to make philological studies an exercise of the reasoning powers, and not a mere effort of memory. Comparative Philology might form a useful branch of study in seminaries of learning. It serves to produce a deep impression on the mind in favour of the great truth,—that mankind were originally one. The figures appended to some words indicate the number of words of similar origin in the same language; the third column gives the meaning of the Sanskrit.

Calcutta, November 1, 1843.

Greek.	Sanskrit.	Meaning.	Cognates.
Αιτία 25,	Hetu 6,	cause,	
Αιξ 6,	Aja,	goat,	*Li.* ozys, *L.* agnus.
Αλειφω 40,	Lip 27,	anoint,	*L.* libo, *Li.* limpu, *L.* limus, *G.* leim, *R.* lipnur.
Αργυροσ 32,	Rajata 10,	silver,	*L.* argentum, *argent.*
Αιθηρ 40,	A'shtra 14,	the sky,	*Ga.* athair, *W.* awyr, *G.* heitre *L.* æther, *ethereal*
Αμφω 9,	Ubha 11,	both,	*L.* ambo, *Li.* abba, *Go.* bai, *G.* beide, *R.* oba.
Αγελη 11,	Kul 76,	herd,	*P.* gillah.
Αχοσ 11,	Aka,	pain,	*G.* ach, *C.* och, *ache.*
Αμα 2,	Amá 6,	together,	*L.* omnis, *Ga.* an, *C.* a. *omniscience.*
Αναπεδον,	Anupadam,	on the foot,	
Ανεμος 31,	An 4,	breath,	*Go.* ana, *W.* enyz, *L.* animus, *Ga.* anain, *animal.*
Ανευ 4,	An 217,	without,	*L.* in, *Go.* un, *inactive.*
Ανηρ 78,	Nar 29,	man,	*Ce.* nér, *P.* nar, *Ga.* anear.
Αγχι 13,	Aṇke 2,	near,	*L.* angustus, *G.* enge, *Li.* anksztas, *R.* uzkii, *C.* agos.
Αω 18,	Vá 65,	blow as wind,	*G.* wehe, *Li.* weju.
Αυδη 20,	Vad 33,	to speak,	*Li.* wadinu, *L.* andió, *audible.*
Αιρεω 145,	Hri 7,	take,	*H.* áráh, *L.* haurio, *Ga.* airde, *heresy.*
Αδια 15,	Adhi 80,	superiority,	αδην, *Ga.* adh, *W.* at.
Αρωμα, 5, *spice,*	A'ráma,	garden,	*Aromatic.*
Αργον 21,	Arjun 2,	white,	*Argent.*
Αριστος, *noblest,*	Arishta 7,	happiness,	*Aristocracy.*
Αλις 12,	Alam 2,	enough,	*L.* alo, *Go.* alia, ολοσ, *all,* *G.* alle, *W.* oll.

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Αισσω 27,	Asa 39,	move,	
Αιδεω 33,	A'drita 2,	respected,	
Αραβος 5,	A'ráv,	sound,	
Αρουρα 28,	Urvará 3,	fertile soil,	*L.* arvum, *A.* ardhi, *arable*, *Ga.* ar.
Αυγη 47,	Achha,	transparent,	*Li.* aszkus.
Ακανθη 32,	Kaṇtak 22,	a thorn,	*L.* acanthus.
Αινω,	Nu 6,	praise,	*Ga.* aìn.
Αξιοω,	Yách,	request,	*Axiom.*
Απο,	Apa 304,	from, without,	*L.* ab, *Go.* ab, *Li.* ap, *G.* auf, *off*, *R.* ob, *Ga.* o.
Αρι,	Uru 29,	much,	*Go.* aìriza, *G.* ehre, *Ga.* air, *C.* ar.
Αρησ,	Ari 13,	enemy,	*Ga.* ar, *W.* aer.
Ασθενεια 33,	Asustha,	unwell,	
Αυξειν 35,	Uchh,	conglomerate,	*L.* augeo, *Li.* augu, *L.* ex, *G.* hoch, εξω, *W.* uch.
Ατμη 13,	A'tmá 68,	wind,	*Go.* ahma, *G.* athem, *atmosphere.*
Αστρον 17,	Táran,	star,	*P.* sitára, *L.* astrum, *Go.* stairno, *G.* stern.
Αλεα, *warmth*,	Ul 1,	to burn,	*L.* vulcanus, *volcano.*
Αρτος, *complete*,	Vrittas 20,	performed,	*G.* werth, *Li.* wertas, *worth.*
Αδινον, *excessive*,	Sádhanam 8,	exhaust, completing,	
Αγος, *crime*,	A'gas, ..	sin,	
Αττον, *nearer*,	Ata,	move to,	*L.* ad, *F.* ad, *Go.* ad, *C.* at, *Ga.* eath, *R.* do.
Ανα,	Anu,	near to,	*Go.* ana, *Li.* na. *Ga.* ann, *G.* an, *one*, *R.* na.
Ακρον,	Agra,	summit,	*akrospire.*

Greek.	Sanskrit.	Meaning.	Cognates.
Αρκτοσ,	Riksha,	a bear,	*L.* ursus, *arctic*, *Ga.* art, *Wa.* aerth.
Αρχι,	Arha,	worthy,	*Arch*, G. erz.
Αγαω,	Acha, anch,	honor,	*Go.* ahia, *G.* achte, αγαθος, *Ga.* agh.
Ανια, *trouble*,	Anaya,	distress,	*Annoy*, *F.* annoyer, *H.* ánah.
Αγερω,	A'graha 3,	seizing,	*L.* grego, *H.* ágar, *exaggerate.*
Αρδω,	Ardra 13,	moist,	
Αδω,	I'dá,	praise,	*Ode.*
Βαλλω 327,	Pil 2,	throw,	*L.* pello, *Li.* pillu, *G.* bolzen, *bolt.*
Βρωσισ, *food*, 18,	Bhriti 10,	nourishment,	βρι.
Βαρον 28,	Bhára 13,	heavy,	*Barometer.*
Βιοσ 74,	Bhab 33,	existing,	φυη, *Ga.* bo, *W.* byw, *biography.*
Βαγμα,	Vagmin 1,	speaking,	R. bain, βοαω, *Ga.* baigh.
Βησω 280,	Vesh 10,	entrance,	
Γαμβρος,	Iámátri,	daughter's husband,	*L.* gener, *L.* geno.
Γη 43,	Go 14,	the earth,	*Go.* gawi, *G.* gau, *Ga.* ce, *geography.*
Γηρυς 25,	Guru,	venerable,	*L.* grandis.
Γαυρον 11,	Garva 9,	pride,	*W.* cawr, *Go.* gaurs.
Γενναω 226,	Jan 95,	born,	*L.* gigno, *Go.* ginna, *genius*, *oxy*gen.
Γερων 26,	Jírna 28,	old,	*G.* greise, *C.* grai.
Γευσις,	Ghas 6,	food,	*Go.* kausia, *L.* gusto, *G.* koste, *R.* ruszain, *gustation.*

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Γοαω,	Ghu,	sound,	*L.* gemo, *Go.* gauno, γεμω.
Γναθος,	Ganda 11,	jaw,	*L.* gena, *Li.* zendas, *F.* joue.
Γυνη,	Jani,	mother,	*R.* zena, *C.* cena, *Go.* quens, *kin*, *Ga.* gein, zen.
Δεω, deficient,	Dí 5,	waste,	[*F.* tire.
Δερω, flay,	Dri,	tear,	Τειρω, *L.* tero, *G.* zehre, *C.* torni, *R.* deru, *Go.* taira,
Δαιοω 38,	Dáh 17,	divide,	*G.* zweie, δευτεροσ, δαιζω, *R.* dwoin.
Δαμαω 44,	Dam 12,	tame,	*L.* domo, *Ga.* duine, *C.* dyn, *G.* zahme.
Δειξω 62,	Dish 20,	exhibit,	*G.* zeigen, *L.* doces, *Go.* teiha, *G.* zeige, *teach.*
Δερκομαι 26,	Drish 37,	see,	*Ga.* dearc, *W.* drem, *Li.* dyru.
Δια,	Dhi,	move,	*R.* dlia, *Ga.* dlu, *Li.* del, *W.* deu.
Διδωμι 135,	Dadámi,	give,	*P.* daden, *Ga.* daigh, *Li.* dumi, *L.* dos.
Διελων,	Dal 25,	cut,	θλαω, *deal*, *C.* tyllu, *Li.* dallyiu.
Δυω 18,	Dwi 126,	two,	*Go.* twai, *Li.* dwi, *Ga.* da, *C.* dau, *R.* dwai, *G.* zwei.
Δεκα 32,	Dashan 32,	ten,	*G.* zehn, *Ga.* deich, *C.* deg, *Go.* taihun, *P.* deh.
Δακνω 45,	Dash 10,	bite,	*Go.* tahia, *G.* zacke, *tack.*
Δακρυ 36,	Asru 3,	a tear,	*W.* deegryn, *Go.* tagr, *G.* zahie, *P.* ter, *S.* ter.
Δεμας 19,	Dehin 19,	corporeal,	*P.* andám.
Δονεω 12,	Dhun 10,	shake,	
Δωμα 62,	Dháman,	house,	*L.* domus, *G.* dom, *R.* dom, *dome.*
Δυς,	Dus 130,	bad,	*C.* dir, *Go.* tus, δυη, δυαω.
Δαηρ,	Devri, devara,	husband's brother,	*L.* levir, *Li.* déwéris, *R.* diever.

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Δραω, *active*,	Dru,	runaway,	*Li.* darau, *Ga.* drabh.
Δρυς, 26,	Dru,	a tree,	*Druid*, *W.* derw, *Ga.* dair, *P.* darakht.
Δερμα,	Charma 37,	leather,	*P.* charm.
Δεσμα,	Dáma 4,	rope,	
Δακτυλος,	Deshiní 1,	fore-finger,	*L.* digitus, *G.* zehe, *F.* doigt.
Δαηναι,	Dhyai,	meditate,	θεαω, *G.* denke, *Li.* dingain.
Δυω, *enter*,	Du,	move,	*L.* duo, *endue*.
Δρεπω,	Drip,	pain,	δρυπτω, *G.* treffen, *R.* drobliu, *Ga.* drip.
Εις, 20,	Eka 122,	one,	*G.* ein, *Li.* weenas, *R.* odin, *Ga.* aon, *C.* un, *Go.* [am, *P.* yik:
Εξ, 14,	Shash 11,	six,	*L.* sex, *P.* shash, *G.* sechs, Li. szeszi, *R.* cat.
Επτα, 13,	Saptan 20,	seven,	*P.* haft, *G.* sieben, *R.* sedm, *Ga.* seachd, *W.* saih.
Εννεα, 10,	Navan,	nine,	*G.* neun, *R.* dewiat, *Ga.* noi, *Go.* niȧn, *Li.* dewyni.
Ερχομαι, 56,	Rich 2,	go,	*G.* reichen, *Ga.* ruig.
Ερημον, 14,	Aranya,	a desert,	*G.* armer, *Go.* arms, *P.* arámid, *hermit*.
Εδω, 23,	Admi,	eat,	*Li.* edmi, *Ga.* ith, C. esu, *L.* edo.
Ειδω, 65,	Vida 109,	know,	*Li.* weidas, *W.* wydh, *Ga.* aithne, *R.* widok, *G.* weise.
Εστι, 63,	Asti,	is,	*Li.* esti, *P.* ast, *Ga.* ata, *R.* est, *G.* ist, *L.* est.
Εκαστος, 6,	Ekákí,	alone,	*Ga.* ceach.
Εκατερος, 7,	Ekataras,	either,	
Ελασσων, 9,	Lesh 5,	little,	*Lose*.
Επαινω, 50,	Pana, 5,	praise,	*Ga.* ain, *epanode*.

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Ερι,	Urí,	great,	*Go.* air, *C.* ar, *Ga.* awr.
Ερις, 21,	Ari,	enemy,	
Ετερος, 22,	Itara 4,	other,	*heterodox, L.* uter.
Ελαχιστος,	Lagheshtha,	light,	*L.* levis. G. leicht, *L.* lengwas, *R.* legkü, *F.* leger.
Εχειν, 302,	I'sh,	possess,	*Go.* aigh, G. eigen, *owe, Li.* jegui.
Ευρυς, 9,	Urí 11,	great,	*Li.* erdwas, *G.* ur.
Ελκος, 11,	Ulká 1,	flame,	*L.* ulcus, *ulcerate.*
Εντερον, 16,	Antra 54,	entrail,	*L.* antrum, *Ga.* eadar.
Ευ, 5,	Su 365,	good,	C. hy, *eulogy.*
Εζω, 93,	A'sana 2,	seat,	*L.* sedeo, *session.*
Ερα, 9,	Irá 4,	the earth,	Go. airtha, *G.* erde, C. ard.
Εριον, 14,	U'rná 6,	wool,	
Εμβρυον, 7,	Bhrúna 4,	fetus,	*Embryo.*
Εσπερος,	Váspa 2,	vapor,	*Vespers.*
Εγειρω,	Jágrita 10,	awake,	
Ετεον,	Satyam 69,	reality,	εθοσ, *ethics, etymology.*
Ετι,	Iti 5,	thus,	*L.* item, *Go.* ith, *Li.* ir, *Ga.* ath.
Επει,	Api 1,	if,	*Go.* jabai, *G.* ob.
Εγχος,	Shanku,	javelin,	*L.* ensis.
Εικω,	Ikh,	go,	*L.* ico.
Εραω,	Bar 10,	chose,	*Ga.* fear, *W.* gwor.
Εργον,	U'rja 5,	effort,	*G.* werk, *work, L.* urgeo, *energy, Go.* waurkia.

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Επι,	Api 4,	before,	*L.* ob, *Go.* bi, *G.* bei, *Li.* pi.
Ζαω,	Jíva,	life,	*Li.* gywas, *P.* ziad, *R.* ziwoe, *zoology*.
Ζυγος,	Yuj,	join,	*L.* jugum, *G.* joch, *R.* igo, *Ga.* ceangal, *C.* jau.
Ηρως, 8,	Shúra,	hero,	*heroine*.
Ησυχια, 10,	A'saka,	sitting,	*Ga.* asaidh, *W.* eiste.
Ηλιος, 34,	Heli,	sun,	*W.* haul, *Li.* el, *L.* sol, *heliocentric*, *R.* solnete, [*aphelion*.
Ηως,	Ushas 42,	day-break,	*G.* ost, *east*, *L.* aurora, *αυρα*.
Ημισυ,	Sámi 3,	half,	*Semi*-circle.
Ηλον,	Kílam 6,	pin,	
Θρηνεω,	Dhraṇ 3,	sound,	*G.* dröhne, *drone*.
Θεω,	Dhú 10,	shake,	
Θυμος,	Dhúmas 28,	smoke,	*Li.* duma, *θυος*, *L.* fumus, *G.* dampf, *R.* dym.
Θηγω, 16,	Tij 2,	sharpen,	*P.* tizad, *Go.* tekan, *Li.* tikumas.
Θυρα, 39,	Dwára 17,	door,	*Ga.* dorus, *G.* thür, *P.* dar, *Li.* dwaras, *W.* dór *R.* [dwor, *C.* drys.
Θαρρω, 42,	Dharsha 11,	pride,	*Li.* drasa, *trust*, *R.* derzost, *dare*
Θης, 6,	Dása 11,	servant,	
Θερος,	Trish 11,	thirst,	
Θλαω,	Dalita 25,	divided,	*G.* theile, *deal*, *R.* dolia, *F.* taille, *C.* tyllus.
Θυσια,	Tud 30,	kill,	

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Θεω,	Dhatu 20,	basis,	*Go.* deds, *deed.*
Θουρος,	Tur 19,	speed,	
Θαλλω,	Dala 12,	leaf,	
Θηλεια	Dhayá,	little girl,	*Go.* thiwi, *R.* diewa.
Θανατος,	Hantá 3,	Kill,	θευω.
Ιχωρ,	Uksh 3,	sprinkle,	*Ichorous.*
Ιαλλω,	Il,	go,	*G.* eile.
Ιαων,	Yavana,	Greek,	*Ionia.*
Ιος, 8,	Visha, 2,	poison,	*L.* virus, *virulence.*
Ιστημι, 350,	Stha,	stand,	*L.* sto, *Ga.* stad, *W.* eistedh, *P.* istad, *R.* stoiu.
Ισχος,	I'shitá 10,	power,	*G.* stehen, eigner, εχω, *Li.* jagin.
Κλεω,	Shál,	praise,	*L.* claro, κολακεια, *F.* clair, *clear*, *G.* klar.
Κογχη, 12,	Shankha 6,	shell,	*L.* concha, *conch*, *F.* conque.
Κενος, 17,	Shúnya 1,	empty,	*G.* kein.
Καλον, 44,	Kalya 14,	healthy,	*Caligraphy.*
Κασσιτερον, 2,	Kastíram,	tin,	*Cassiterides.*
Κυων, 31,	Shwan 4,	dog,	*W.* cûn, *canine*, *L.* canis, *Ga.* cu, *F.* chien.
Και,	Cha,	and,	*L.* que, *R.* golosga, *S.* clypian, *Ga* ces.
Καλεω, 100,	Kal 20,	to sound,	*G.* halle, κολωος, *L.* clamo, *call.*
Καλυμμα, 60,	Kúl,	cover,	

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Κελευω, 37,	Kil,	order,	
Καγχαζω, 1	Káku,	laugh,	*Chuckle*, *L.* cachinnor, *G.* kichele, *R.* chikaiu.
Κεφαλη, 64,	Kapála 12,	skull,	*L.* caput, *Ga.* cean, *G.* kopfe.
Κλαω, 33,	Klish 5,	afflict,	*L.* clades, *R.* klui.
Κυριος, 27,	Guru 33,	master,	*G.* kerl, *Li.* karalus.
Κολλος, 42,	Khol 7,	lame,	*L.* claudo, *Go.* halts, *G.* halt, χωλος.
Κλειω, 52,	Kúl,	enclose,	*L.* clavis, χαλινος, *L.* celo, *G.* hehlen, *Ga.* cei
Κρυπτω, 30	Gup 35,	hide,	*Crypt.*
Κακος,	Kachchara,	vile,	
Καμπτος,	Kampitas	quivering,	
Κωμα,	Sham 12,	repose,	*L.* comis, ***comatose.***
Κραζω,	Krush,	sound,	*Crow.* *L.* crocio. G. krähe. *Li.* krokin.
Κλυδων,	Klid 2,	damp,	
Κειρω,	Chiri 2,	wound,	*L.* corium, ***crush***, *L.* crucio, *G.* kratze.
Κτισις,	Kshiti 15,	abode,	*Ga.* cai.
Καμνω,	Ksham 5,	endure,	
Κιλλος,	Khara,	ass,	
Κηβος,	Kapi 23,	ape,	*L.* cephus.
Κοραξ,	Karata,	crow,	*L.* corvus, *G.* krähe.
Κις,	Kíta 6,	insect,	
Κολεος,	Shalka 3,	rind,	*G.* hülle, schale, ***hulk***, ***shell.***

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Κεαζω,	Kaṣh 4,	hurt,	*Li.* kassau, *R.* koszu.
Κυκλος,	Kosha 20,	globe,	*H.* gálal, κυλιω, *cycle.*
Κωμος,	Káma,	love,	*Comedy.*
Κωκυω,	Shoak 20,	grief,	*Li.* szaukin, *G.* quack, *R.* kokuiu.
Κλυω,	Shru 28,	hear,	*R.* sluch, *Ga.* cluinn.
Καρχαρον,	Karkara 4,	hard,	χαρασσω, *character.*
Κηλεω,	Kil 2,	play,	χαλαω. *Ga cal.*
Κυτος,	Kuḍi 8,	curve,	σκυτος.
Καλια, *nest,*	Kuláya 5,	nest,	
Κρεας,	Kravya 5,	flesh,	*L.* caro, *carnal, F.* carnaval.
Κρυερον,	Krúra 14,	cruel,	*F.* cruel, *L.* crudelis, *cruelty.*
Κηδος,	Kheda 10,	sorrow,	
Ληις 30,	Luth 2,	rob,	*L.* læsio, *G.* leid.
Λυω 84,	Lí 2,	liquefy,	*Li.* leju, *C.* llaith, *G.* lauge, *R.* lüanie.
Λεγω,	Lók 3,	speak,	*L.* loquor, *Go.* lahia, *G.* lache, *R.* likuiu.
Λαβω 167,	Labh 21,	take,	*L.* libro, *leave.*
Λαω 10,	Loch 5,	see,	*L.* luces, *look, G.* leuchte.
Λειχω 17,	Lih 6,	lick,	*L.* lingo, *H.* loâ, *Li.* lezu, *P.* lazad, *G.* ligh, *Ga.* imlich, *R.* lizaníe.
Λυχνος, 13,	Lok 6,	shine.	*L.* lucerna. *W.* lluch. *Ga.* loiche. *S.* leohd ;
Λαχω,	Lagh 2,	obtain,	*L.* lego, *Go.* laika, *R.* leczu, *Li.* laigau.
Λιθος	Loshṭa 7,	clod,	*Lithographie.*

Greek.	Sanskrit.	Meaning.	Cognates.
Λωβη,	Lup 20,	cut,	*R.* lupliu, *Li.* luppu, *lop*, λεπτος.
Λυπεω,	Lup,	vex.	
Μεθυ 17,	Madhu 38,	intoxication,	*W.* médh, *G.* meth, *P.* mai, *C.* ***medd***, ***mede***, μαοα, [*R.* med.
Μητις 30,	Mati 8,	intéllect,	*L.* mens, *Go.* munds, ***mind***, *G.* muth.
Μαραγδον 4,	Marakata 1,	emerald,	
Μελαθρον 2,	Malina,	dirty,	
Μαστακα 18,	Mastaka 1,	head,	μασταξ, ***masticate.***
Μεγαρον,	Mahá griha 1,	great house,	
Μελαν 26,	Malina 24,	dirty,	*L.* malum, *G.* maal, ***mole***, *R.* malewain, moil, *Go.* [melia.
Μυχου 7,	Mukha 36,	entrance,	*G.* mund, *Go.* meuths, ***mouth***, μυτις.
Μαργον 18,	Múrkha 9,	foolish,	*L.* morus.
Μαθητης 52,	Matha,	school,	*Mathematics.*
Μαντις 65,	Mantṛi 26,	a sage,	
Μαραινω 11,	Marana 2,	dying,	*L.* marcor, *G.* morde, *R.* moriu, ***murder.***
Μεγα 25,	Mahán 239,	great,	*W.* mawr, *Ga.* mór, *G.* mauch, *Li.* macnus, *P.* mah.
Μη 16,	Má 1,	not,	*Ga.* mi.
Μενος 14,	Manas 50,	mind,	*G.* meinung, *Li.* mintis, *R.* mniu, *C.* mynnu, ***mean.***
Μητηρ 42,	Mátri 23,	mother,	[*R.* mater. *P.* madar, *Ga.* mathair, *G.* mutter, C. maw, μαια,
Μισγω 70,	Misra 75,	mix,	*Li.* maiszau, C. mysgu, *P.* amizad, *R.* mieszanie.
Μενεαινω 27,	Mánya,	respectable,	

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Μναομαι 88,	Mná,	remember,	*Ga* smuain.
Μωρον 11,	Múr,	fainting,	
Μογεω 8,	Mogh,	move,	*L.* machinor, *G.* mache, *make.*
Μαω 21,	Moha,	sensuality,	
Μελας 26,	Mala 17,	dirt,	*Melancholy.*
Μετρον,	Miti 10,	measure,	*Go.* mita, *Li.* mettoia.
Μυω,	Mú 3,	tie,	*L.* Mutus, *mute.*
Μισεω,	Mish 2,	envy,	*Misanthropy.*
Μετα,	Mith,	unite,	*Go.* mith, *G.* mit, *R.* mez, *mid, S.* mid.
Μαγεια,	Máya 15,	delusion,	*L.* magicus, *magician.*
Μηκαζω,	Mish 1,	sound,	*Li.* mikenu, μυθος.
Μαργαω,	Múrchhán,	fainting,	*L.* moria.
Μηδος,	Medh,	understand,	*G.* muth, *Li.* mislis, *mood, R.* mysl.
Μερος,	Marman 7,	joint,	*L.* membrum, μοιρα, *R.* miera, *Li.* mora.
Μαζα,	Mánsa 14,	flesh,	*Go.* mes, *G.* mett, *C.* maeth, *Li.* miesa.
Μωρος,	Muhira 2,	fool,	*L.* moria.
Μαρνω,	Mrina,	injure,	
Ναυς 40,	Náu 7,	ship,	[*C.* nawf, *P.* nau. *Go.* nota, *nautical, L.* nauta, *Ga.* navi, *G.* nachen,
Νομος 53,	Nema 45,	precept,	*Astronomy, F.* nomade. [*G.* neu, *F.* neuf.
Νεος 66,	Nava 33,	new,	*L.* novus, *W.* newydh, *Ga.* nua, *P.* nau, *R.* nowyi,
Νεφελη 25,	Nabhas 28,	cloud,	*W.* nivwl, *Ga.* neamh, *G.* nebel, *L.* nebula, *R.* nebo.

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Νυξ,	Nishá 28,	night,	*L.* nox, *G.* nacht, *R.* noez, *Ga.* nochd, *C.* nos.
Νειατος,	Nichai 5,	below,	*G.* nieder, *R.* nizkü.
Νευρον,	Snasá,	nerve,	*G.* snur, *L.* nervum, *R.* sner.
Νυος,	Snusá,	daughter-in-law,	*L.* nurus.
Νεεται,	Nay 12,	lead,	*L.* nuo, *Go.* neiwa, *G.* neige, *R.* nesu.
Νηρος,	Nír 10,	water,	*Nereids.*
Ξιφος, 12,	Kshi 15,	wound,	*A.* seif, *H.* tsává.
Ξυρω', 82,	Kshúr 11,	razor,	*Li.* skirren, *shear*, *G.* schere.
Οκτω 10,	Ashtrin 24,	eight,	*G.* achte, *P.* hesht, *L.* octo, *R.* osm, *C.* wyth, *R.* voseme, *Ga.* ochd.
Ομιχλη 2,	Megh 38,	cloud,	*Li.* migla, ομιχλεω, *R.* mgla, *P.* migh
Oδυνη 34,	A'dínav,	pain,	*Anodyne.*
Ομον 41,	Sam,	similar,	*Go.* sama, *homologate*, *G.* samt, *same*, *L.* similis, αμα, *R.* samyi.
Ολον 14,	A'lam,	extensive,	*W.* oll, *Ga.* aile, all, *G.* *all*, *Go.* ols.
Οιτον 2,	Ití,	calamity,	
Ονομα 76,	Nám 8,	name,	*Go.* namo, *W.* enu, *Ga.* ainm, *P.* nam. *G.* name.
Οστεον 16,	Asthi 21,	bone,	*L.* os. *osteology*
Οφρυς 22,	Bhrú 8,	eye-brow,	*G.* braue, *P.* abru, *R.* browi.
Ορμη 30,	U'rmi 4,	current,	
Οικος 172,	Qka 3,	house,	*Li.* ukis, *parochial*, *G.* wick, *L.* vicus, *Go.* weihs, *R.* wes.
Ομιλος 20,	Mila 10,	meeting,	*Homily.*

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Ομβρος,	Ambhas, 12,	water,	*L.* imber.
Ουσια,	Vasu, 30,	substance,	*G.* wesen, *Go.* wisan, *R.* weszcz.
Ορω,	Ri,	approach,	*L.* orior, ορθος, *oriental*, *H.* ar.
Ορος,	Vṛish, 14,	sprinkle,	ερση, *L.* urino.
Οσσομαι,	I'kshu, 4,	see,	*Optics.*
Οιδεω,	Edh,	increase,	
Οιφεω,	Yabh,	copulate,	
Οδον,	Adhwan, 5,	road,	*Period.*
Οιεται,	U'hate, 4,	infer,	
Πεταλον,	Patra, 44,	leaf,	
Πεντε, 26,	Paṇchan, 100,	five,	*Go.* fimf, *Li.* penki, *R.* piat, *G.* fünf, *P.* penj, W. [pump.
Προ,	Pra, 957,	before	*Go.* faura, *Li.* pra, *G.* vor, *L.* prius.
Πολιν, 77,	Pura, 13,	city,	*G.* burgh, *Li.* pillis, *Ga.* baile, πυργος, *metropolis.*
Παρος, 5,	Puras, 37,	before,	*L.* præ, *G.* vor, *fore.*
Πρηθω, 30,	Prush, 3,	burn,	*P.* afruzad, *L.* buro, *fire.*
Πλουω, 88,	Pláv,	submerge,	*L.* lavo, *R.* plavaiu.
Πεσσω, 7,	Pachati, 13,	bake,	*P.* pazad, *G.* backe, *R.* peczenie.
Πτερον, 65,	Patrin, 44,	winged,	*L.* penna, *feather*, *R.* ptica, *G* feder.
Πονος, 104,	Paṇa, 18,	business,	*L.* pensum, ποιεω.
Περαω, 66,	Pára,	get over,	*L.* perio, *G.* fahre, *fare*, *Li.* puru.
Παγη, 117,	Pásha, 13,	noose,	*L.* pages, *G.* fasse, *R.* pazu, *fasten.*

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Πιον,	Pína, 3,	fat,	
Πραυς 17,	Prasanna,	pleasing,	*Go.* friathwa, *G.* freund, *Li.* prietelus.
Περυςι 3,	Parut, 1,	last year,	*Go.* fairnis.
Πρυτανις 7,	Pradhán,	superior,	
Πετρου 16,	Prastar,	rock,	*Petrify.*
Παλλαξ 5,	Bhálàka, 29,	girl,	
Πους 190,	Pada, 34,	move,	*Li.* pedas, *Go.* fotus, *G.* fuss, *foot*, *W.* pëd.
Παιδευω 71,	Upadesha, 10,	instruction,	*Pædagogue.*
Παω 12,	Pá,	nourish,	
Πατασσω 13,	Pat,	fall,	*πιετω*, *R.* padaiu.
Πιω 105,	Pá,	drink,	*L.* poto, bibo, *R.* pitie.
Περι,	Pari, 350,	round,	*Li.* pri, *Go.* fair, *L.* per, *R.* pri.
Πιπτω 113,	Pat, 13,	fall,	
Προς,	Prati, 255,	to,	*L.* pro, *Go.* faur, L*i.* pro, *G.* f'ïr.
Πρωτος,	Prathama, 9,	first,	*Li.* pirmas, *L.* pristinus, *R.* peruyi.
Πωλος,	Phal,	fruit,	*L.* pullus, *Go.* fula, *G.* füllen, *foal*, *L.* filius.
Παρα,	Pára, 190,	surpassing,	*Go.* fair, *Li.* par, *L.* pro, *R.* pra.
Πυρ 106,	Prush, 2,	burn,	*L.* buro, *G.* feuer, *R.* pariu.
Πλεω,	Plu,	swim,	*L.* fluo, *Li.* plaukin.
Παππος,	Papu,	protector,	*L.* pappus, *H.* abba, *pappa.*
Παχυς,	Bahusas, 82,	great,	*L.* pinguis, *R.* puczu.
Πησσω,	Pash, 2,	bind,	*Li.* paszau, *L.* positus, pango, *G.* fang.

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Πορω,	Púr. 22,	fill,	*Go.* fairra, *L.* porro.
Πλατεια,	Prithu, 6,	large,	G. breite, *Li.* plotis, *Go.* braids.
Πρασσω,	Prich, 4,	touch,	*Practice.*
Πυλεω,	Pal, 20,	move,	*Pole.*
Πολυ,	Pal, 14,	great,	*Go.* fulla, G. voll, *full*, *L.* pleo, *R.* polniu.
Πυθων,	Budh,	knowledge,	*L.* puto, *Li.* bundu, *R.* bdiu.
Πυργος,	Purí, 12,	town,	*G.* bürg, *Go.* baurgs, *C.* brig, *F.* bourg.
Πρεσβυς,	Prabhu,	chief,	*Presbyter.*
Ρεω, depart, 137,	Ri, 3,	move,	*L.* ruo, *Go.* runs, *run*, ροος, *R.* rieiu.
Ρητος 86,	Rádhaná, 2,	speech,	*Go.* rodia, C. reithio, *G.* redner, *R.* ritor, *L.* rhetor.
Ροιζος,	Rása, 6,	sound,	*L.* rugio, *Go.* rukia, *G.* rausche, *R.* ryczu.
Ρησσω 94,	Rish, 12,	separate,	*Li.* rézas, *G.* reisse, *L.* rosio. *R.* riez.
Ρεζω,	Rádh, 8,	accomplish,	*G.* rath. *Li.* redau.
Ροιβδος,	Rav, 2,	sound,	*Go.* ropia, *G.* rufe, *R.* rewu.
Ριγος,	Rikh, 1,	fear,	*L.* rigeo, *G.* recke, *rigor.*
Σαλευω,	Shal, 2,	move,	*Salient.*
Σειρα 12,	Seru,	chain,	*L.* series, ειρω, *Go.* siwia, *Li.* suwu.
Στερεος 10,	Sthira, 23,	firm,	*Li.* storas, *G.* starr.
Συν,	Sam, 550,	with,	*Li.* su, *Ga.* so, *G.* sammt. *R.* so. *L.* simul, *P.* ham.
Στομα 106,	Stoma, 1,	praise.	*G.* stimme.

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Σπλην 6,	Plíhan, 1,	spleen,	*Splenetic.*
Σημα 62,	Símá, 11,	boundary,	
Σεβω 38,	Sev, 12,	worship,	*Serve.*
Στιβαρον 42,	Sthabira, 2,	fixed,	*Stiff.*
Σπαιρω 7,	Sphár, 11,	throb,	
Σευω,	Su,	go,	*Go.* saija, *G.* säe, *sow*, *Li.* seju, *R.* sieiu.
Σκια 43,	Chháya, 20,	shade,	*P.* sáyah, *R.* sien, *Go.* skadus, *G.* schatte.
Σειριος,	Súrya,	sun,	*G.* sonne, *L.* sirius, *C.* haul, *Li.* saule.
Σπαω,	Spháy,	increase,	*L.* spisso, *Li.* spaudziù.
Σφιγγω,	Spash, 6,	bind,	*G.* spitze.
Στυλος,	Sthala,	firm ground,	*G.* stiel, στηλη, *Ga.* stol, *R.* stul, *G.* stuhl, *stool.*
Στηνιον	Stan, 13,	bosom,	
Στεγω,	Sthag, 10,	cover,	*G.* stecke, *stick*, *Li.* stegiu, *L.* stagno.
Στειβω,	Stambha, 10,	stiff,	*G.* stopfe, *L.* stipo, *G.* stopfe, *stop*, *R.* stupaiu.
Σφαιρα,	Swar, 37,	sky,	*P.* siphar, *G.* sphäre, *atmosphere.*
Σηραγξ,	Surangá, 1,	hole	
Τρια,	Tri, 160,	three,	*Li.* trys, *R.* tri, *Ga.* tri, *G.* drei, *Go.* threis.
Τετταρες,	Chatur, 30,	four,	*R.* czetwertyi, *Li.* Ketwortas, *G.* vierte.
Τιθημι,	Dhá, 40,	place,	*Ga.* deanam.
Ταρασσω, 31,	Tras, 3,	fear,	*L.* terreo, *R.* triasu.
Τρεχω 172,	Trag, 1,	move,	*L.* traho, *Go.* thragia, *G.* trage, *drag*, *Li.* traukin, *R.* trogain.

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Ταχα,	Tak,	move,	*Li.* teku, *R.* teku, *Ga.* tegam.
Τον,	Tam,	it,	*Go.* thana, *G.* den, *R.* tot, *Li.* ta.
Τερπω 15,	Tarpana, 4,	pleasing,	*Li.* tarpsatu.
Τοκος 126,	Tuj, 2,	offspring,	*G.* zeuge, *Go.* tauhia.
Τεινω 203,	Tani, 71,	extend,	*L.* tendo, *G.* dehne *tend.*
Τεκτων 48,	Takshan, 4,	carpenter,	*G.* teiche, *Li.* taszau, *L.* tignum, *R.* teszu.
Τελειω,	Tal, 2,	complete,	*Li.* czelas, *R.* ciel, *G.* ziel, *L.* solidus.
Τιτθη,	Tátá,	mother,	*Go.* thiuda, *Ga.* tuath, *C.* tud, *R.* tesecza.
Τοτε,	Tathá, 4,	then,	*L.* tum, *G.* dann, *Li.* tada, *then*, *R.* togda.
Τερμα,	Tarman,	limit,	*W.* tervyn, *Ga.* teor,
Τερεω,	Trí,	pass across,	*L.* tero, *L.* trans, *Go.* thairh.
Τυπτω,	Tup, 2,	injure,	*G.* tapfe, *tap*, *R.* topaiu, *F.* tape.
Τηρεω,	Trá, 5,	preserve,	
Τε,	Tu,	but,	
Τυχος,	Tuj, 2	offspring,	*G.* Zeugen, *Go.* tauhia, τεκω.
Τρυσις,	Trut, 4,	cut,	*L.* tero, *G.* driesse, τρητος, *R.* tru, *G.* trenne,
Τυφος,	Dhúpa, 6,	incense,	G. dufte.
Τρυγεω,	Dhrákh,	dry,	*L.* tergo, *G.* trockne, *drain.*
Τερχνος,	Tṛiṇa, 34,	grass,	
Υετον 12,	Utta, 4,	wet,	*L.* udum, *G.* otter, *Li.* udra.
Υδωρ 63,	Uda, 43,	water,	*L.* unda, *Go.* wato, *Li.* wandu, *wet*, *R.* wydra.

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Υπο,	Upa, 186,	beneath,	*L.* sub, *Go.* uf, *G.* ob, *Li.* pa, *up*, *R* pa.
Υφαω 38,	Váp, 5,	weave,	*L.* opus, *web.*
Υιος,	Súsh,	bring forth,	*Li.* sunus, *R.* sieu, *L.* satus, ινις.
Υψου,	Uchchakais, 30,	high,	*W.* uchediad *G.* hoch.
Υγιεω,	Oj, 3,	strength,	*Hygiene.*
Υστερος,	Uttara, 66,	superior,	*L.* exterus.
Υγρος,	Uksh, 1,	wet,	*Li.* uktas.
Υπερ,	Upari, 5,	above,	*L.* super. *Go.* upar, *superior.*
Φοβος 34,	Bhíshma, 55,	terror,	*L.* paveo, *Li.* bijau, *R.* boiu.
Φαω 60,	Bhá, 24,	shine,	*L.* foveo, *Go.* botia, φαιδρος.
Φλεξω 60,	Plush, 2,	burn,	*L.* flagro, *G.* blitze, *Li.* blizgu *R.* blistain.
Φαγω 112,	Bhoga, 19,	eat,	*L.* fagis, *anthropophagi.*
Φωνη 121,	Ván, 15,	sound,	*G.* weine, *euphony.*
Φυη,	Bhú,127,	be,	*Go.* baua, *be*, *L.* fons, *R.* bywau, *Ga.* bu.
Φιλεω,	Pál,	protect,	φυλασσω. *philantrophy.*
Φρισσω,	Bhrasj, 1,	parch,	*L.* frigeo, *G.* frierend, *R.* priazus, *L.* frigus, *G.* frost.
Χειρ 120,	Kara, 74,	hand,	*Li.* hir, *Ga.* cior, *cheiromancy.*
Χθες 4,	Hyas, 1,	yesterday,	*L.* heri, *Go.* gistra, *G.* gestern, *yester.*
Χαμαι 7,	Bhími, 53,	earth,	*L.* humus, *Li.* zieme, *R.* zemlia.
Χθων 14,	Kshoni, 7,	earth,	

GREEK.	SANSKRIT.	MEANING.	COGNATES.
Χαλκον 48,	Khalina, 2,	bridle bit,	
Χειμα,	Hima, 37	cold,	*Li.* ziema, *R.* zima.
Χαρτος,	Hristas, 8,	joyful,	
Χριω,	Ghṛi, 21,	sprinkle,	
Χοιρος,	Kira, 1,	hog,	
Χαινω,	Khan, 7,	dig,	
Χην,	Hansa,	goose,	*L.* anser, *G.* gans, *Li.* zasis, *R.* gus.
Ψαω 56,	Pas,	touch,	
Ωφελιμον,	Aphala,	unfruitful,	
Ωμον,	A'ma,	raw,	
Ωδη,	I'ḍ,	praise,	*L.* ode. *ode.*
Ωκυς,	A'shu,	quick,	*L.* ocior.
Ως,	Yat,	as,	*L.* ut, *Go.* at

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Aptare,	Apnoti, 10,	provide,	*Go* hafts, αφθεις, *F.* apte, *P.* yábad, *H.* aphad, *S.* [habbạn.
Œvum,	A'yu, 9,	age,	*L.* ætas, αιων, *Ga.* aois, *C.* eu, *G.* ewig.
Aciem,	Asra,	edge,	*Go.* ahs, *G.* ecke, *C.* awch, *L.* acer, ακη, *R.* ostrie.
Axis,	Aksha, 2,	wheel,	*G.* achse, *Li.* aszis, *axle*, αξων, *R.* os.
Ago,	Aj,	move,	αγω, *agent*, *enact.*
Anser,	Hansa, 16,	goose,	*G.* gans, *Li.* zasis, χην.
Aula,	A'laya,	house,	*Hall*, αυλη, *G.* halle, *H.* áhal.
Annus,	Háyana,	year,	Ενος, *H.* shánáh, *annual.*
Antiquus,	Antaga, 1.	dead,	αντιος, *antiquity*, *L.* ante.
Ambio,	Am, 205,	move,	αμφι, *G.* um, *Li.* api, *C.* am, *R.* ob.
Ars,	Artha, 53,	cause,	G. art, *artist*, αρετη.
Abjectus,	Avagít,	reproached,	*Abject.*
Aveo,	Av,	excite affection,	οιω, *avidity*, *H.* ábháh. *W.* awyz.
Alvus,	Ulva,	womb,	*L.* vulva, *alvine.*
Arvus,	Urwará,	fertile land,	αρουρα, *L.* ruris, *arable.*
Anguis,	Nága,	snake,	G. unk, *Li.* angis, εχις, *R.* uz.
Acer,	Khara, 3,	sharp,	οξυς, *F.* aigre, *acrid.*
Alo,	Pál, 12,	nourish,	*Aliment.*
Ab,	apa,	separate,	*Go.* af, G. ab, *of*, *Li.* ap, *R.* ob, *Ga.* o.
Ad,	At,	approach to,	*Go.* at, *C.* at, αττω, *S.* æt.
Antrum,	Antara, 54,	within,	Εντος, αντρον.
Aqua,	A'pah,	water,	*Go.* ahwa, *Li.* uppâ, *S.* ewe, *L.* amnis, *P.* áb.
Aurora,	Ushas, 42,	dawn,	*Li.* auszras, *R.* utro.

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Œquus,	A'ikya,	unity,	εικος, *equity.*
Avis,	A'ti,	bird,	αετος, *C.* adn, *aviary.*
Œs,	Ayas,	iron,	*Go.* aiz, *G.* eisen, *F.* airain, *S.* æs, *A.* ayar.
Arceo,	Ṛich,	screen,	ειργω, αρκεω, *coercion.*
Aut,	Uta, 2,	also,	ητε, *Go.* aithaw, *Ga.* achs, *C.* ai, *G.* auch.
Ante,	Ati, 112,	over,	*Go.* and, *G.* ant, *Li.* at, *Ga.* ath, αντι.
Aries,	U'rṇá wool,	ram,	*Li.* eris, ερραος,
Amarus,	Amla, 19,	sourness,	*H.* ṃar, *L.* myrrha, μυρρα.
Amo,	Am, 1,	honour,	ιμερος, *H.* chamad, *amiable, P.* kam.
Ansa,	Ansha, 10,	part,	*H.* ozen.
Arena,	Renu, 2,	dust,	*H.* cháron, *L.* areo, *F.* arène.
Arma,	Barman, 2,	armour,	*armed, F.* armee.
Argentum,	Rájata,	silver,	αργυρος, *Ga.* airgidh, *W.* arriant.
Alius,	Anyas,	the other,	αλλος, *G.* jener, *Li.* anas, *R.* inyi, *C.* allan.
Bellum,	Valam,	army,	πολεμος, *belligerent,* βελος.
Bibit,	Pivati, 27,	drink,	πιω, *H.* phi, *imbibe.*
Buccinum,	Bukka, 5,	sound,	βυκανη.
Bonus,	Púnyas, 33,	virtuous,	*L.* bene, *benefit, F.* bien.
Cacumen,	Shikhá, 16,	top,	*Li.* kaukaras, *G.* acumen.
Calix,	Kaliká, 3,	unblown,	*G.* kalch, κυλιξ, *R.* kulgan, *Li.* kylikas. [νος, *holm.*
Collis,	Kúla,	a mound,	*G.* hülle, κωλον, *Li.* kalwa, *R.* cholm *G.* kulm, καλω

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Cordis,	Hṛid,	heart,	*Ga.* criodhe, *G.* herz, καρδια, cordial, *Li.* szirdis, *Go.* [hairto.
Creo,	Kṛi,	make,	κρεω, *L.* cura, .*G* kram, *Li.* kromas.
Concha,	Shankha,	shell,	κογχη, *conch*, *F.* conchites.
Clam,	Chulum,	disappear,	*L.* clandestinus, *H.* âlam.
Cœlum,	Khila,	empty,	κοιλον, *celestial*, *F.* celeste.
Carus,	Shreyas,	excellent,	*Li.* geras, *C.* car, *L.* gratus, χαριεις, *F.* cher.
Carmen,	Karman,	incantation,	*L.* cæremonia, *F.* ceremonial.
Cano,	Gána,	sing,	*Ga.* canam, *W.* canu, *F.* chant, *S.* galan.
Cæsaries,	Kesha, 49,	hair.	*Li.* kasa, χαιτη.
Cœdo,	Shad, 7,	wound,	*G.* schäder, *Li.* skaudus, *scathe*, κηδω.
Cortex,	Kṛitti,	bark,	*cork*, *G.* kork, χρως,
Crepusculum,	Kshapá.	night,	*L.* crepus,
Crus,	Kshura.	hoof,	*H.* keráng, *crural*, *F.* crural.
Cio,	Chi.	collect,	γαω, χεω, *excite.*
Centum,	Shatam, 66,	hundred,	εκατον, *Ga.* ciad, *R.* sto, *G.* hundert, *Li.* szemtas, *P.* sad.
Cymba,	Kumbha, 18,	water jar,	κμμβος, *P.* khum, *cymbal.*
Caligo,	Kalusha, 3,	opacity,	αχλυς, *caliginous.*
Cautes,	Kataka, 1,	rock,	*F.* queux, *L.* cos.
Carcer,	Kárágára, 2,	jail,	*L.* coerceo, *incarcerate*, *F.* concierge.
Cella,	Kula,	abode,	κλειω, *H.* kálá, *celler.*
Crux,	Kṛichhra, 3,	pain	ικριον, cross, *F.* croix.
Candeo,	Chanda, 9,	warm,	*G.* scheine, *kindle* *Go.* skeina, *C.* cyane.
Calamus,	Kalama, 3,	reed,	*L.* culmus, *G.* halm, *R.* soloma, *F.* chaume.
Caleo,	Jwálá, 16,	flame,	*Li.* szilta, κηλεω, *F.* chaud, *calefaction.*

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Clavis,	Shlesh, 10,	junction,	*L.* clausus, κλειω, *S.* cæggian, *clavicle.*
Curro,	Char, 28,	go,	G. karren, *car,* χορος, *F.* char, *current.*
Celer,	Chalat, 14,	moving,	*Li.* kelu, κελης, *celerity, F.* celerite.
Celo,	Shal,	cover,	*Ga.* ceil, *C.* celu, *G.* hehle, *hill,* κλειω, *W.* cel.
Ceva,	Gau, 75,	cow,	G. kuh, *R.* gowiado, *P.* gau, *Z.* gao, *S.* cu *H.* gaah.
Contus,	Kunta, 2,	lance,	κοντοσ,
Cingo,	Kuch, 9,	confine	κυκλος, *L.* coxa, *cincture.*
Como,	Káma,	desirable,	κομεω, *L.* comis, *comely.*
Cerno,	Kṛí,	scatter,	κρινω, *L.* caro, *discern.*
Carbasus,	Kárpása,	cotton,	καρπασος, *H.* karpas, *P.* karfas, *A.* karbas,
Cum,	Sam,	with,	*Go.* ga, *Ga.* co, C. can, *F.* con, *commotion.*
Corpus,	Garbha, 34,	fetus,	C. corf, *corpse, G.* korper, *F.* corps.
Cranium,	Shiras, 32,	head,	*Go.* hwairm, *G.* hirn, κρανιον, *F.* cräne, *Ga.* caran.
Calva,	Shal, 2,	cover,	*Li.* galwa, *Ga.* coll, αυλη, *L.* cella, *R.* golowa.
Cirrus,	Shiroja,	hair,	κορση, *L.* crinis, *Li.* karczis, *R.* szerst, *S.* cyrran.
Coxa,	Kuksha, 3,	belly,	*hough,* κοχωνη, *S.* hog.
Caro,	Krabya, 5,	flesh,	κρεας, *carnal, F.* carnal.
Cruor,	Srabana,	oozing,	*Li.* kraujas, C. crau, *L.* crudus, *gore, R.* krav.
Colo,	Halin, 13,	cultivator,	*Li.* kalu, *Go.* holo, *colony,* κλαω, *G.* höhle, *R.* kalu.
Cadus,	Kaḍa,	waterpot,	*C.* caed, *kettle,* κοτυλος, *R.* kad, *Go.* kas, *G.* kessel.
Caulis,	Shala,	stake,	G. keule, *Li.* kolas, καυλος, *R.* kol.
Cassus,	Shesha,	diminish,	χατεω, κατα, *L.* casus, *R.* ko.
Clausus,	Shlishta,	connected,	κλειω, *close,* G. schluss, χωλυω, G. halts.

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Conor,	Shaṉ, 6,	move,	κονεω.
Cras,	Shwas, 2,	to-morrow,	*Procrastinate.*
Certus,	Shraddhá, 20,	belief,	κριτος, *certain*, *F.* certainment.
Cutis,	Kritti,	skin,	κυτος, *G.* haut, *hide*, *R.* koza, *cuticle.*
Credo,	Shraddhá,	faith,	καρδια, *credit*, *L.* credulus, *F.* credit.
Dies,	Divasa, 23,	day,	*Ga.* dia, *W.* dydh, *G.* tag, δαος, *Li.* diena, *R.* den, *S.* [dœg.
Disco,	Dishta,	advised,	*W.* dysgu, δεικνυω, *G.* zeige, *Ga.* teagasg, δοκεω,
Dexter,	Dakshiṇa, 7,	right hand,	*Li.* dezine, *Go.* taihswa, δεξια, *R.* desnaia, *dexterity.*
Domo,	Dám, 12,	tame,	δαμαω, *Go.* tamiths, *G.* zahm, *H.* dáma, *C.* dyn, *A.* tamnnu, *Ga.* duine.
Durus,	Dhṛi,	hold,	*Li.* turru, *C.* tariu, *G.* daure, τηρεω, *H.* dor, *P.* turaz.
Deus,	Deva, 162,	God,	*Ga.* dia, *C.* diuw, θεος, *Li.* diewas, *P.* dio.
Dens,	Danta, 45,	tooth,	*W.* dant, *Go.* tunthas, *Li.* dantis, *P.* dandam, οδους [*G.* zahn. [*dentist.*
Da,	Dá, 35,	give,	*Li.* dunis, δανος, *R.* dan, *Li.* dünis, *Z.* da.
Debilis,	Durbala,	difficult,	*debility*, *F.* debile, *H.* dáv, *A.* dab.
Decus,	Tejas, 16,	dignity,	*C.* tegwch, δει, *G.* tugend, *indecorous.*
Divido,	Vidhava, 2,	separate,	*G.* weide, *L.* viduus, ιδιος, *division.*
5 Dis,	Dwishas,	twice,	δια, *Ga.* dis, *displace*, *F.* dis, *Go.* *dis.*
× Domus,	Dháma,	house,	δωμα, *G.* dom, *dome*, δεμω, *R.* dom, *Ga.* dom.
Densus,	Dehin,	corporeal,	*G.* dick, δασυς, *Li.* duzas, *H.* dáshen, *A.* dashan.
Dormio,	Drá,	sleep,	δαρθεω, *G.* träum, *R.* dremliu, *dream.*
Decem,	Dashan, 32,	ten,	*Ga.* deich, *R.* desiat, *Li* deszimt, *G.* zehn, *P.* deh.

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Esse,	Astu,	be,	*Essence, present, F.* essentiel, *Ga.* as, *W. ys.*
Et,	Atha, 4,	and,	ηδε, *G.* und, *Li.* ir, *F.* et, *Ga.* as.
Evanesco,	Vinásha,	disappear,	*Evanescent.*
Ego,	Aham,	I,	*G.* ich, *Ga.* mi, *C.* mi, *P.* men, *R.* ia, εγω, *Go.* ik.
Ensis,	Asi, 2,	sword,	εγχος.
Estus,	Iddha, 14,	blazing,	αιθος, *G.* hitze, ***heat***, *Ga.* aodhair, C. ete.
Eo,	Ay, 1,	go,	*Li.* eimi, *transient*, *W.* he.
Ex,	Uchcha,	high,	*Go.* us, *G.* aus, *Li.* uz, *Ga.* as, C. uch, *R.* woz.
Erro,	Ir, 2,	go,	*G.* irre, *err*, ερρων, *F.* erre. [*S.* etam.
Edo,	Ad,	eat,	εδω, *G.* essen, *R.* iedenie, *Go.* itands, *Ga.* ith, *edbile,*
Fundus,	Phandas, 1,	belly,	*fundament.*
Femina,	Vámá,	woman,	*Ga. W.* benw, *effeminate,* bean. [*Li.* peru, bean.
Fero,	Bhṛi, 32,	bear,	φερω, *Ga.* beir, *G.* bären, *P.* barad, *R.* beru,
Fluvius,	Plava,	piece of water,	πλοος, *R.* plawen. *G.* fluss, *Go.* flodus, *S.* flum.
Folium,	Phal, 90,	bud,	*L.* floreo, *G.* blühe, *foliage Ga.* plur. [*Ga.* brathair.
Frater,	Bhrátri,	brother,	*Go.* brothar, *W.* brodyr. *R.* brat, φρατωρ, *P.* braudur,
Frons,	Pránta, 1,	border,	*front.*
Fuit,	Bhavati,	be,	φυεται, *P.* bawad, *beeth.*
Fanum,	Vayunam,	temple,	ναον, *profane.*
Ferox,	Parusha, 4,	severe,	φηρ, *H.* pere, *ferocious.*
Foris,	Vahis,	outwards,	*L.* fores, *forensic.*
Findo,	Vibheda, 31,	splitting,	*Bite, L.* fodio, *G.* faden, *H.* bádad.
Fetus,	Sphtíam, 9,	open as a bud,	φυτος, *F.* fetus.

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Focus,	Bhás, 24,	light,	φωγω, *suffocate*.
Fari,	Bhásá, 10,	word,	φαζω, *L.* fas, *nefarious*.
Filius,	Bálisha, 2,	young,	φυλον, *affiliate*, *F.* filial.
Fugio,	Bhíshá, 1,	dread,	*Li.* begu, φυζω, *R.* biegu, *F.* fuis, *refuge*.
Fremo.	Bhraṇ,	sound,	βρεμω, *F.* fremir.
Finis,	Phaṇita,	gone,	φενω, *F.* finis, *infinite*.
Garrio,	Grí,	sound,	*Li.* girru, *G.* girre, *L.* gyrus, γηρυω, *R.* graiu, *garrulous*.
Genus,	Jana, 95,	mankind,	*Ga.* gean, ενος, *P.* zenne, *Li.* gemu, *Go.* kuni, *kin*.
Genu,	Jánu, 3,	knee,	γονυ, *G.* knie, *Go.* kniu, *P.* zánu, *F.* genou, *R.* gnu, *S.* cneou.
Gravis,	Guru, 22,	heavy,	*Go.* gauria, *F.* grave, *R.* grubyi, *gravity*.
Gero,	Gṛah, 78,	take,	*gesture*, *F.* geste, *P.* girad.
Gelu,	Jala,	cold,	*R.* cholod, *Li.* szaltis, *G.* kälte, *F.* gelee, *gelid*, *S.* cælan.
Gustus,	Ghasti, 6,	eat,	γευω, *G.* kost, *gustation*.
Gutta,	Hita,	poured,	χυτος.
Hodie,	Adya, 4,	to-day,	*Go.* hindag, *G.* heute, *Ga.* anduigh, *Li.* szendien.
Humus,	Bhúm, 35,	earth,	*Li.* zieme, *P.* bum, χαμαι, *Go.* guma, *exhume*.
Hyems,	Hima, 37,	cold,	*Li.* ziema, χειμα, *F.* hivernal.
Hora,	Horá,	hour,	ωρα, *F.* heure, *H.* aor, *hourly*, *horsocope*.
Hircus,	Eraka,	ram,	*L.* hirsutus.
Horritus,	Hṛishta,	haire erect,	ορρωδεω, *horrent*.
Hæres,	Hṛi, 7,	take,	*L.* gero, χηρος, *hereditary*.
Hædus,	Edaka,	ram,	*H.* gedi.

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Id,	Iti,	it,	*Go.* ita, *G.* es, *Ga*, e, *R.* ono.
Idem,	Idam,	this,	*L.* item, *F.* item, *identity*.
Ignis,	Agni, 70,	fire,	*Li.* ugni, αιγλη *R.* ogn, *Ga.* aghna, *ignite*.
Inquit,	Kathá, 20,	word,	*Quote*.
Intra,	Antar, 54,	midst,	*Go.* undar, *Ga.* eider, εντος, *under*, *R.* wnutr.
Ita,	Iti, 5,	thus,	ειτα.
Itum,	Eti, 1,	going,	ιθυς, *Li.* eimi, *Go.* iddia, *C.* æthym, *R.* idu, *H.* atha.
Imbris,	Ambhas, 12,	water,	ομβρος.
Ira,	I'ṛshyá, 9,	envy,	ερίζω, *ire*, *R.* iaryi, *S.* yrre.
Jungo,	Yuj, 40,	join,	*Go.* juk, *Ga.* ceangail, *C.* jau, *P.* yugh, *G.* joch, *R.* igo.
Jovis,	Div,	heaven,	*H.* yehováh [ηβαων.
Juvenis	Yuvan,	young,	*P.* yuvan, *W.* jeuant, *Li.* jaunas, *G.* jugend, *R.* iunyi,
Jecur,	Yakṛit,	liver,	ηπαρ, *hepatic*, *F.* hepatique.
Jus,	Yúsha,	soup,	*juice*, *Li.* juka, *R.* iucha, *F.* jus.
Justus,	Yuta, 3,	adapted	*Justice*, *F.* justesse.
Jurgo,	Jarj, 2,	blame	οργιζω.
Loquor,	Loch,	speak,	λογος, *elocution*, *Go.* lahia, *R.* likuiu.
Labium,	Lapanam, 7,	mouth,	*C.* lap. *Li.* lupe, *G.* lippe, *F.* levre, *S.* lippa, *P.* law.
Lædo,	Ludi, 14,	resist,	λαζω, *G.* leid, *F.* lese.
Lætus,	Hlád, 3,	delight,	λαω, *glad*, Go. lusto, *Li.* losztu, *G.* lüste.
Levis,	Laghu, 27,	light,	λειος, *levity*, *relief*.
Ligo,	Lig, 7,	touch,	*Li.* laikan, λυγοω, *F.* lie, *oblige*, *L.* religio.

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Libido	Lubdhd,	desirous,	*Go.* leibia, *G.* liebe, *Li.* lubijas, *love*, *R.* liubow, *H.* levàv,
Locus,	Loka, 35,	world,	λαος, *G.* lage, *C.* llach, λεχος, *R.* loze, *local*, *F.* local.
Lux,	Loka, 9;	shine,	*Go.* leiks, *W.* lhug, λευκος, *R.* luez, *light*, *G.* licht.
Luvium,	Lína,	melted,	λυω, *lave*, *L.* alluvium, *F.* alluvion.
Ludo,	Laḍ,	sport,	*H.* luz, *ludicrous*, λαυω, *G.* letze.
Lateo,	Luḍ,	conceal,	λαθω, *H.* lát, *latent*, *F.* latent.
Longus,	Lagna, 4,	connected,	*G.* lang, *Go.* langs, *F.* long, *S.* lengian, *longitude*.
Moles,	Múla, 20,	root,	*Mole*, *L.* moles, *F.* môle.
Murmur,	Marmara,	rustling,	*G.* murmeln, μυρμυρον, *Li.* murmas, *R.* murczu.
Miror,	Mrish,	discern,	μερδω, *mark*, *Go.* marka, *G.* merke, *admire*.
Mordeo,	Mṛid,	grind,	μεριζω, *G.* morsch, *remorse*.
Murus,	Mur, 5,	encircle,	*G.* maure, *immure*, *F.* mure, *L.* moror, *Li.* muras.
Malus,	Mala,	sin,	*G.* mahl, μελας, *F.* mal, *A.* malam *malevolent*, *S.* mal.
Mare,	Míra,	ocean,	*Go.* marei, *W.* môr, *Ga.* muir, *R.* more, *G.* meer, *A.*
Mas,	Mánusha,	man,	*C.* mon, *G.* mensch, *R.* muz, *Go.* manna, *masculine*.
Medium,	Madhya, 28,	midst,	*Go* midums, *G.* mittle, μεροϛ, *R.* mezdu, *P.* mian, marakv.
Meum,	Mama,	mine,	*G.* meiner, *Ga.* mo, *P.* men, *G.* ma. [*mediate*.
Magnus,	Mahán, 239,	great,	*R.* mogucz, *Ga.* mor, *C.* mawr, *Li.* maenus, *G.* manch,
Menda,	Manda,	vile,	μειων, *mendacious*. [μεγας, much.
Mens,	Manas, 103,	mind,	*Go.* man, *C.* mynnu, *mental*, *G.* meinen, *A.* manyi. [mass.
Metiri,	Mita, 10,	measured,	*Go.* mitaths, μνα, *L.* modus, *H.* mádad, *R.* meza, *G.*
Mors,	Mṛita, 34,	dead	*Li.* marinu, *W.* marw, *H.* meth, *Ga.* marbh, μοροϛ,
Mus,	Múṣh,	mouse,	μυϛ, *P.* mush, *G.* maus, *R.* mysz, *S.* mus. [*R.* merius.

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Motus,	manṭh,	agitate,	μοθος, *Li.* metu, *G.* mühe, *R.* metaui, *motion.*
Mitto,	Míta, 4,	cast,	μεθιημι, *missile, F.* missionaire.
Moneo,	Man,	understand,	μηνυω, *G.* mahne, *mean, R.* manui, *monument.*
Musca,	Mashaka, 5,	mosquito,	μυια, *midge, Li.* musse, *P.* magas, *G.* mucke, *R.* mucha.
Mensis,	Más, 11,	month,	*G.* mond, *Li.* menú, *F.* mois, μεις, *Go.* menoths, *Ga.* mios.
Mersio,	Mṛishta, 6,	sprinkling,	*Li.* merkui, *F.* merge, *immersion.*
Mulier,	Mallá,	woman,	*G.* magd, *Go.* magaths, *muliebrity.*
Mensa,	Máṇsa, 16,	flesh,	*Go.* mes, *Li.* miesa, μαζα, *G.* mett, *R.* miaso, *C.* maeth.
Meto,	Mash,	cut,	*Mow, mess,* αμετος, *G.* mähd, *Go.* maita,
Mancus,	Manák,	little,	*Li.* menk, *C.* man, *minikin.*
Mugio,	Muj, 1,	sound,	μυκαω, *L.* musso, *mutter, G.* muhe, *Li.* myczu.
Mitis,	Mitra, 12,	friend,	*Mitigate, F. Mitiger.*
Muto,	Mithas, 5,	reciprocally,	*H.* mot, *mutation, F.* mutabilite.
Miscere,	Misra, 70,	blend,	μισγω, *H.* mezeg, *A.* masak, *S.* miscan, *mixture.*
Mutilo,	* Muṣh, 26,	cut,	μασσω, *Go.* matia, *Li.* muczu, *R.* myczu, *G.* mutze, *mutilate.*
Munio,	Man,	oppose,	μενω, *R.* maniu, *ammunition, municipal, F.* munition.
Monile,	Maṇí, 29,	gem,	μανος,
Madeo,	Mid, 5,	liquify,	*Li.* maudau, μυελος, *L. R.* mytyi, medulla.
Meditor,	Medh, 6,	comprehend,	μηδω, *Go.* modo, *Li.* mishju, *R.* mysliu, *meditation.*
Mundo,	Maṇd, 23,	ornament,	ματτω, *F.* monde.
Medulla,	Medas, 12,	marrow,	*R.* mozg, *G.* mark, *medullary.*
Mutus,	Múka, 1,	dumb,	μυκος, *mute, F.* muet.

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Nuncius,	Nunna,	sent,	νεος, *annunciate.*
Nutus,	Nata,	bowed,	νευω, *H.* nuang, *nod*, *W.* amneidio.
Nasis,	Násá, 20,	nose,	*G.* nase, *Li.* nosis, *R.* nosada, *nasal.* [*H.* nakah.
Neco,	Násha, 26,	destruction,	*L.* noceo, νεκυς, *H.* nákáh, νοσος, *nick*, *A.* nikayat,
Novem,	Navan, 16,	nine,	*G.* neun, *P.* nah, *R.* noi, εννεα, *C.* naw, *november.*
Nox,	Nakta, 28,	night,	*W.* nôs, *Ga.* nochd, *G.* nacht. *Li.* naktis, νυξ, *nocturnal.*
Nepos,	Naptá,	grandson,	ανεψιος, *W.* nai, *R.* netii, *G.* neffe, *F.* neveu, *nepotism.*
Neve,	Navá, 1,	not,	νη, *H.* ain, *Ga.* neo.
Nubes,	Nabhas, 28,	cloud,	*W.* nev, *Ga.* neamh, *G.* nebel, *C.* niwl, νεφος, *R.* nebo.
Nubo,	Nivará,	virgin,	νυμφη, *nymph*, *connubial*,
Nurus,	Snúsa,	daughter-in-law,	νυος, *G.* schnur, *R.* snocha.
Nos,	Nah,	us,	*Go.* unsis, *Li.* mues, *R.* nas. [nyth.
Nidus,	Níd, 2,	nest,	νεοττος, *S.* nesan, ναιεταω, *R.* gnezdo, *Ga.* nead, *W.*
Nomen,	Nám,	name,	ονομα, *G.* name, *R.* imie, *Go.* namo, *P.* nám, *Ga.* ainm, [*S.* nama.
Orno,	U'rṇu, 1,	cover,	*Adorn*, ωρα, *F.* ornement. [atachk, *Ga.* aca.
Oculus,	Akshi, 10,	eye,	οκκος, *G.* auge, *Go.* auga, *Li.* akis, *R.* oko, *F.* œil, *A.*
Os,	Asthi, 21,	bone,	οστεον, *osteology*, *F.* ossu, *G.* ast, *Z.* astem, *P.* astekhun.
Ovis,	Avi, 2,	sheep,	οις, *ewe*, *Li.* awis, *Ga.* uan, *C.* oen, *R.* owen.
Odium,	Yuddham, 17,	war,	ωθεω, *odious*, *F.* odieux, οδυσσω
Otium,	A'sanam,	seat,	*Ease*, *Go.* azi, οκνος, εζομαι.
Ostium,	A'syam,	mouth,	*R.* uste, *L.* os, *ostiary.*

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Orbus,	Arbha,	child,	*G.* erbe, *ορφανος*, *F.* orphelin, *orphan.* [*Go.* ahtan.
Octavus,	Ashṭrama,	eight,	οκτω *P.* hasht, *C.* wyth, *Li.* ashtum, *R.* osm, *Ga.* ochd [*pasture.*
Pastum,	Puṣh, 80,	nourish,	*Go.* fodia, *G.* fütter, βοσκω, *R.* pastuch, *H.* ávas,
Pater,	Pitṛi, 42,	father,	*Go.* fadar, *P.* pader, *Go.* athair, *G.* vater, *R.* batia.
Patera,	Pátra, 14,	plate,	ποτηριον, *patter*, πεταω.
Pes,	Páda, 106,	foot,	*Li.* pêzczias, *P.* pa, *G.* pfote, *R.* piata, πεζος, *pedestrian.*
Placere,	Pṛiya, 37,	please,	*Placid.*
Pluo,	Plu, 3,	go,	*L.* fluo, *Li.* plauju, *G.* fluss, *Ga.* fliuch, *S.* fleuwan.
Polleo,	Bala, 17,	army,	πελω, *equi-pollent.*
Post,	Paschat, 4,	after,	*Li.* pas, *Ga.* foi, *R.* po, *F.* puis, *postpone.*
Potis,	Pati, 14,	master,	*Li.* pats, *P.* bud, ποσις, *Go.* faths, *R.* pan, *potent.*
Prœlium,	Pralaya,	destruction,	*L.* prælum, [*R.* proszu, *P.* porsad.
Precor,	Prachh, 4,	inquire,	*Li.* prasyatas, *G.* sprechen, *Go.* fraicha, φραζω, *pray,*
Primus,	Prathama,	first,	*R.* perwyi, *G.* fürste, *Li.* permas, *Go.* fruma, *primitive.*
Prope,	Prapana,	arriving at,	*R.* protiw, *propinquity.*
Pullus,	Phullati,	blossoming,	πωλος, *poultry*, *F.* pullulér.
Putare,	Budh, 35,	understand,	πευθω, *Li.* bundu, *impute.*
Puer,	Putra, 25,	son,	*P.* pur, παις, *puerile. Z. potre.*
Puteo,	Púti, 30,	stinking,	*Li.* putas, πυεω, *F.* pus, *putrid.*
Purus,	Pú, 35,	purify,	G. butze, πυρ, *F.* purifier, *puritan.*
Pecu,	Pashu, 23,	beast,	*Go.* faihu, *G.* vieh, πων, *Ga.* beathach, *pecuniary.*
Pistum,	Piṣh, 24,	pound,	*L.* pinso, πισσω, *Li.* paisau.

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Parvus,	Páyyas,	low,	*Ga.* beg, *C.* bach, *Li.* piggus, *G.* feige, *Go.* faws, παυρος.
Plenus,	Pulas, 14,	great,	*Go.* fulls, πλεος, *plenitude.*
Paveo,	Bhí, 55,	fear,	*Li.* bijau, πτοεω.
Piscis,	Payas, 18,	water,	*G.* fisch, *C.* pysg, *fish*, *Go.* fisks, *F.* poisson, *piscivorous.*
Pingo,	Pij, 5,	colour,	πεικω, *R.* piszu, *F.* peins, *paint.*
Pigeo,	Puchh,	careless	*H.* págar.
Pungo,	Pija,	kill,	*Go.* fija, *Li.* piaujeo, *L.* pugna, πεικω, *G.* fechte, *point.*
Puteus,	Puḍ, 10,	hole,	βυθος, *G.* pfutze, *pit*, *F.* puit.
Pars,	Pṛithak,	cast,	*H.* paras, *party*, *F.* partir.
Palus,	Palwala,	pond,	*G.* pfuhl, πηλος, *pool*, *S.* pul.
Pontus,	Páthis, 7,	sea,	ποντος.
Pardus,	Pṛidáku,	leopard,	παρδος, *G.* parder, *Li.* pardas, *leopard.*
Picus,	Pika, 7,	cuckoo,	*G.* picker, *F.* pie.
Palea,	Palla, 3,	straw,	*Li.* pellas, *R.* plew, *F.* paille, *pallat.*
Pellis,	Phalaka, 2,	shield,	φολις, *G.* fell, *Li.* plewe, *R.* pleua, *C.* pil, *S.* flys.
Portus,	Pára,	cross over,	*G.* fahre, *fare*, πορος, *ford*, *import.*
Postis,	Pash,	bind,	*G.* feste, πιεζω, *R.* pazu, *post.*
Pilum.	Pílu, 2,	arrow,	*G.* pfeile, παλλω, *pill.*
Pugna,	Pinja,	killing,	*G.* feind, *Li.* piaujas, *R.* pichaiu, πυξ, *F.* pique, *pugnacious.*
Peto,	Paṭh, 5,	recite,	*Go.* bida, *G.* bitte, *petition.*
Patulus,	Paḍal, 1,	thatch,	πεταω, *H.* páthâh, *patent.*
Quot,	Kati,	how many,	κοσος, *Li.* koks, *R.* kak, *quotient.*

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Que,	Cha,	and,	*Ka.*.
Quis,	Kim,	what,	*Li.* kas, *P.* ku, *Go.* hwas, *G.* wer, *R.* koi, *Ga.* co.
Quid,	Yad,	what,	κοιον, *P.* ku.
Quinque,	Panchan,	five,	πεμπτος, *R.* piatyi, *G.* fünfte, *Go.* fimfta. *quinquennial.*
Quies,	Shete, 18,	sleeping,	*Li.* kajus, κειται, *quietude*, *R.* koiu.
Quatuor,	Chatur, 30,	four,	*Li.* ketturi, *Ga.* ceithir, *R.* czetyre, *G.* vier, τετταρεσ, [*P.* chehar *W.* pedwar.
Rectus,	Rita,	true,	*G.* recht, *Go.* raihts, *right*, *S.* riht.
Rex,	Rájá, 108,	ruler,	*Go.* rakia, *Ga.* righ, *G.* reich, *C.* rhi, *A.* reys, *regal.*
Rheda,	Ratha, 29,	car,	*Li.* ratas, *G.* rad, *Ga.* rotha, *C.* rhod, ρεδιον, *L.* rota, *rotation.*
Ritus,	Ríti,	custom,	*G.* reite, *L.* ortus, ορσις, *ritual.*
Ros,	Rasa,	juice,	ερση, *roscid*, *R.* rosa, *F.* arrosee.
Rapio,	Riph, 2,	injure,	*G.* rauben, αρπαω, *H.* árab, *Go.* raupia, *rob*, *R.* rubacz.
Ruo,	Ri, 2,	move,	*Go.* rinna, *L.* rivus, *Li.* rauju, *R.* roiu, ρυω, *rush.*
Rodo,	Rad, 10,	break,	ρησσω, *G.* reissen, *Li.* rezas, *rout.*
Rudo, roar,	Rud, 5,	wail,	ροζω, *Li.* raudoiu, ροθος, *R.* rydaiu.
Rugo,	Ruksha,	rough,	*G.* rauhe, *Li.* raukiu, *L.* raucus, *corrugate.*
Repo,	Rep, 2,	move,	ρεπω, *F.* rampe, *reptile.*
Spiro,	Spṛi, 1,	breathe,	*Spirit*, *F.* esprit.
Signum,	Chihma,	sign,	σημειον, *signify*, *F.* signaler, *S.* segen, *H.* saman.
Sulphur,	Shulwári,	sulphur,	*Sulphuric.*
Senex,	Sanna, 40,	shrunk,	*Li.* senas, *Go.* sineigs, *senior*, *W.* hen, *Ga.* sean, *A.* chen.
Sanies,	Sanas,	excrement;	*H.* shena.

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Succus,	Sechana,	sprinkling,	*G.* saft, *R.* sok, *F.* suc, ***suck***, *L.* sunkiu.
Scando,	Skand, 6,	jump,	*σκαζω*, *G.* schiezze, ***shoot***, *Li.* skecziu.
Suus,	Swa,	his,	*G.* sich, *Go.* seins, *Li.* sawas, *R.* swoi, εος, ***suicide.***
Serpens,	Sarpa, 28,	creep,	*ερπω*, *F.* serpent, ***serpent***, *W.* sarf.
Servire,	Seva,	serve,	*ερυω*, ***service***, *σαοω*, *F.* sauve.
Silex,	Shila, 28,	stone,	*χαλιξ*, ***silicious.***
Socer,	Swashura,	father-in-law,	*εκυρος*, *Go.* swaihra, *Li.* sessû, *W.* chwegran, *G.* schwa- [her, *R.* swekor.
Sopio,	Swapna, 13,	sleep,	*L.*sapnas,*G.*schlaf,*Go.*slepaR.spanie,*υπνος*,***soporiferous.***
Sono,	Swan, 5,	sound,	*Go.* sangws, *Li.* zwanas, C. syniu, *R.* zwon, *G.* sang.
Statio,	Sthiti, 40,	place,	*Go.* stads, *G.* statte, *Li.* stonas, *R.* staiu, ***stationary.***
Suavis,	Swádu,	sweet,	*L.* suadeo, ***suavity***, *F.* suavite.
Super,	Upari, 5,	above,	*υπερ*, *Go.* ufar, *G.* uber, *P.* ábar, ***superior.***
Satis,	Sádh,	finish,	***Satiate***, *R.* syszczaiu, *Li.* sotinu, *G.* sättige, *αδω*.
Sine,	Sanna,	little,	*L.* situs, *L.* se, *Go.* seithu, *G.* seit, *R.* s, ***sinecure.***
Sat,	Sat,	proper,	***Satisfy.***
Semis,	Sámi, 3,	half,	*ημι*, *F.* semi, ***semi-god.***
Sterno,	Stṛi,	spread,	*στραω*, *L.* stratum, *G.* strasse, *Go.* strauja, *R.* stroiu, [***strew.***
Scindo,	Khanḍa, 32,	tear,	*σχιζω*, *G.* scheiden, *L.i* skutta, *Go.* skaida, ***rescind.***
Scutum,	Khed, 2,	shield,	*σκυτος*.
Spes,	Spṛihá, 5,	desire,	*σπαργη*, *F.* espoir, ***despair.***
Surrus,	Swara, 11,	sound,	*G.* surren, *συρω*.
Suadeo,	Swádu,	pleasing,	***persuade***, *F.* suasion.
Severus,	Swṛi,	pain	*σεβεσθαι*, ***severity***, ***persevere.***

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Stupidus,	Stambha,	stupid,	στρυφνος, *stiff, Li.* stiprus, *G.* steiffe, ϑηπω.
Sol,	Súrya,	sun,	ηλιος, *H.* hálal, *A.* halal, *R.* solntse, *solar.*
Serum,	Sáyam, 8,	evening,	οψηρον, ορος, *F.* soir, *soiree.*
Similis,	Samatá, 550,	equality,	ομαλος, *H.* semel, *similar.*
Scelus,	Skhalana, 5,	wicked,	σκωλον, *Go.* skuld, *G.* schuld, *Li.* skelas.
Socius,	Sakhi, 6,	friend,	*Li.* segu, σασσω, *F.* socie, *associate.*
Stultus,	Sthúla, 40,	dull,	*L.* stolidus, *stultify.*
Specio,	Spashya, 5,	see,	*G.* spahe, *Li.* spigas, σκοπος, *H.* sháqaph, *inspect.*
Spolio,	Phal,	cleave,	φλαω, *file, Li.* peloiu, *L.* pellis, *R.* peliu, *G.* feile.
Spargo,	Sphurchh,	spread,	*Li.* sprogstu, σφριγαω, *G.* springe, *spring.*
Sedes,	Sadas, 3,	meeting,	*Go.* sitts, *G.* sitz, *Li.* sedziu, εδος, *seat, R.* sazu.
Scire,	Súchi, 17,	espy,	*Sight, G.* sicht, *L.* sagio, *G.* schaue, *show.* [desiccate.
Sitis,	Shus.hka,	dry, 12,	*Li.*sauzau, *L.*siccus, σαυκος, *R.*suchü, *C.*sych, *desiccate.*
Satur,	Sád, 6,	weariness,	*G.* satt, *Li.* sotus, *R.* sytyi, *Go.* sads, *S.* sadian, *satiate.*
Spissus,	Sphíta,	swollen,	*Li.* spaustas, σπιδνος, *inspissate.*
Seco,	Sagha,	hurt,	*C.* sígu, *saw, L.* securis, *insect, sex,* C. sigu, *R.* sieku.
Salio,	Shal,	move,	αλλομαι, *Go.* salta, *F.* saillis, *H.* hale. *salient.*
Sudus,	Shuddha,	pure,	αγαστος, *L.* castus, *Go.* gods, *chaste.*
Taceo,	Túshníka, 3,	silent,	ακεω, *tacit.*
Tactus,	Twach,	move,	θιξις, *Li.* tíkumas, *Go.*tekan, *R.*tykaiu, *take, F.*toucher.
Tœda,	Dah,	burn,	δαις, *Ga. doth.*
Tepeo,	Tap, 34,	heat,	τυφω, *Ga.* tath, *P.* tábad, *R.* teplyi, *F.* tiede, *tepid.*

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Tenuis,	Tanu, 71,	thin,	*L.* tener, *G.* dünn, *C.* tenau, *P.* tanak, *H.* táchan, *R.* tonok, ταναος, *A.* tanazzur, *S.* tiny.
Terra,	Dhará, 15,	earth,	*W.* daear, *Ga.* tir, χωρα, *Go.* airtha, *S.* eard, *A.* arz.
Tonitru,	Stanyitnu, 2,	thunder,	τονω, *S.* thunar, *P.* tundar, *G.* donner.
Trans,	Trí,	across,	*Go.* thairh, *G.* durch, *C.* tros, *R.* czrez, *Ga.* thar, τραω.
Tres,	Trayas, 160,	three,	*Go.* thoreis, *Li.* trys, *P.* seh, τρια, *R.* tri, *C.* tri, *S.* threo.
Tuus,	Tvam,	thou,	*G.* deiner, *R.* twoi, *Ga.* do, *Go.* theins, *Li.* tawas, *C.* tau, *W.* dy.
Taurus,	Túvara,	bull,	*W.* tarw, *Ga.* tarbh, *G.* stier, *Go.* stiurs, *H.* tor, *A.* taur, ταυρος.
Tego,	Twach, 8,	cover,	*G.* decken, *C.* techu, τεγω, *Li.* dekis, *Ga.* tigh, *W.* ty, *G.* dach, *R.* dek, τειχος, *S.* thecan, *protect.*
Tundo,	Tuḍ, 30,	wound,	θυσσω, *G.* tode, *dead, F.* tu, τυπτω, *Ga.* tath, *contusion.*
Talentum,	Tulá,	gold measure, 14,	ταλαντον, *G.* zoll, *toll, F.* talent.
Terminus,	Tarman,	top,	*Term,* τερμα, *Ga.* teor, *W.* tervyn.
Tentam,	Tanti, 1,	expansion,	τεινω, *Go.* thania, *G.* dehne, *tend, R.* tianu, *Li.* tesiu.
Turget,	Tarjat, 3,	censure,	*Turgid,* οργαω.
Talis,	Tulya, 8,	like,	τηλικος, *retaliate.*
Tueor,	Tej, 2,	guard,	τιω, *tuition.*
Terreo,	Trása, 8,	terror,	ταρασσω *L.* tristes, *G.* trauer, *Go.* drobna, *P.* tars, [*terrify.*
Tollo,	Tul,	weigh,	*G.* dulde, *Go.* thula, ταλαω, *H.* thálá, *toleration.*
Tenebræ,	Tamas, 23,	darkness,	*G.* dammern, *Li.* tamsinu, *R.* temnost, *dim, P.* dihms, *A.* [dins.
Torreo,	Tṛish, 11,	thirst,	τερσομαι, θερος, *G.* dürre, *F.* taris, *Li.* trokstu, *Ga.* tart.

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Tondeo,	Tuḍ,	cut,	τενδων, τομειν, *tonsure*, *F.* tonsure.
Tumultus,	Tumula,	uproar,	*Tumultuous*, *L.* tumes.
Talus,	Tala, 8,	bottom,	ταλᾶν.
Tremo,	Dram,	move,	τρεμω, *tremor*, *F.* tremble.
Trudo,	Trut, 5,	break,	τρυω, *intrude.*
Trunco,	Tṛih,	hurt,	τρυχω, *truncated*, *G.* drücke, *Li.* drozu.
Turbo,	Thurv,	injure,	θορυβος, *disturb*, *G.* trübe, *F.* trouble.
Tono,	Tan, 4,	sound,	τονος, *G.* töne. *F.* tonne, *intonation.*
Ustus,	Ushnam, 42,	burn,	ηως, αυω, *combustion*, *H.* esh, *ashes.*
Uterus,	Udara, 13,	belly,	ουθαρ, *G.* euter, *udder*, *R.* utroba.
Unitus,	Anwita, 1,	joined,	εις, *Go.* ains, *G.* einer, *one*, *R.* odn, *Ga.* aon, *C.* un, *S.* an.
Urgeo,	Urja, 7,	effort,	εργον, *work*, *urgent*, *G.* werk.
Uter,	Yatara,	whether,	*G.* oder, *either*, *R.* ieter, ετερος.
Umbra,	Abhram, 10,	cloud,	*F.* ombre, *umbrageous.*
Ursus,	Riksha, 2,	a bear,	αρκος, αρασσω, *P.* khirs, *F.* ours.
Unda,	Uda, 43,	water,	υω, *Go.* wato, *Li.* wandu, *inundate.*
Un,	An, 217,	not,	αν, *Go.* un, *Ga.* an C. an, ανευ, *G.* ohne, *L.* in, *R.* wnie.
Urina,	Vári, 40,	water,	ουρον, *urinal.*
Utor,	Yat, 8,	persevere,	οθω, *use*, *F.* use.
Vacuo,	Vich, 20,	separate,	οιχομαι, *G.* weiche, *Go.* wiko, *F.* vaque, *L.* vaco, *H.* báqaq.

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Volo,	Vlí,	choose,	ελω, *Go.* wilia, *will*, *R.* woliu, *G.* wahle, *Li.* weliju.
Valeo,	Val, 17,	cover,	ειλω, *wall*, *L.* vallus, *G.* wohl, C. gwell, *R.* waliu.
Vates,	Bhaṭṭa, 33,	a sage,	υδης, φατις, *vaticinate*, *W.* barth, *Ga.* bard, *H.* parat.
Ve,	Vá,	or,	*H.* vau, ουαι.
Veho,	Vah, 19,	carry,	οχεω, *G.* wege, *weigh*, *L.* via, *Li.* wezu, *R.* wozd, *S.* weg.
Venor,	Van, 1,	honor,	ονημι, *Go.* unna. [C. gwynt, *Go.* wind.
Ventus,	Váta,	wind,	αητης, *G.* wind, *Li.* wejas, *P.* bad, *Ga.* gaoth.
Verto,	Varta, 20,	turning,	*Go.* wairda, C. wrth, *ward*, ερδω, *R.* werzcu.
Vestio,	Vastra, 18,	cloth,	*G.* watte, εσθης, *weed*, *Go.* wasti, *F.* veste, *vesture*.
Victus,	Vijitus, 6,	defeated,	*Victory*, *L.* victima, *F.* victoire.
Videre,	Vid, 109,	know,	*G.* weiss, *wit*, *C.* wyddus, *wizard*, ιστωρ, *R.* wiedee.
Vidua,	Vidhava, 2,	widow,	*L.* viduus, ιδιος, *Go.* authis, *S.* weodues, *G.* óde, *P.* biwa.
Villa,	Palli, 2,	village,	*Li.* ɼillis, *Ga.* baile, *F.* village, *villa*.
Vieo,	Ve,	weave,	*Li.* weju, ιτεα, *R.* wiiu. [*S.* wær, *Li.* wiras.
Vir,	Víra, 35,	hero,	*C.* wraig, *Go.* wair, *Ga.* fear, *G.* wehren, *war*, *H.* gavar,
Viridis,	Harita, 20,	green,	*L.* herba, *verdure*, χορτος, *F.* verdure, *H.* phera.
Vita,	Vid, 109,	exist,	βιοτη, *vital*, *P.* ziád, *F.* vitement.
Vivo,	Jív, 53,	life,	*W.* byw, *Ga.* beo, *Li.* gywas, βιος, *revive*.
Vox,	Vách, 34,	speak,	ηχεω, *G.* wasche, *F.* voix, *R.* weiszczaiu, *invocate*.
Verres,	Váráha, 5,	boar,	ερρωος, *S.* bar, *R.* barov, *A.* varaz *P.* baret.
Vado,	Pad,	foot,	πατεω, *wade*, οδευω, *Go.* itho, *G.* wate.
Vello,	Vil, 1,	divide,	ελω, *Go.* wilwa, *revulsion*.

LATIN.	SANSKRIT.	MEANING.	COGNATES.
Vomitus,	Vámita, 7,	vomit,	εμεω, *Li.* wemia, *H.* phum, ***emetic.***
Vesper,	Váspa, 8,	vapor,	εσπερος, ***vespers***, *R.* vetcher, *F.* vesperie.
Versus,	Vritta,	verse,	*Go.* wairtha, ***reverse***, *L.* verto, *S.* færs.
Vetus,	Víta, 14,	gone,	*R.* wetchü, *F.* vieux, ***inveterate***, ετος, *Ga.* eata, *L.* ætas.
Vigil,	Vij, 2,	active,	υγιαινω, *L.* veges, *Go* waka, *G.* wache, ***wake.***
Verus,	Varyas, 2,	excellent,	*Li.* wiernas, *Ga.* fearr, *G.* wahr, *R.* wierny, *C.* gwir, ***verity.***
Vorax,	Vṛika, 8,	take,	***Worry***, *Li.* wilkas, *G.* würge, *H.* bagyar, βορα, *S.* werigeh.
Vereor,	Var,	select,	εραω, *Go.* weria, *G.* ehre, *R.* wieriu, ***reverence.***
Vario,	Varn.a, 49,	color,	***Variety***, *F.* variant.
Vitulus, 7,	Vatsa, 17,	calf,	ιταλος.
Vasto,	Vast, 3,	injure,	***Waste***, αταω, *G.* wüste, *F.* devaste.
Vagio,	Vásh. 2,	cry,	*H.* bekeh.
Vicus,	Vish,	dwell,	οικος, *Go.* weihs, *Li.* wissas, ***vicinity.***
Vago,	Vag,	go,	οχεω, *L.* vacilla, ***wag***, *G.* wacklen, *F.* vague.
Vulcanus,	Ulká, 4,	fire,	***Volcano***, αλεα,
Vicis,	Vich, 2,	interval,	*Go.* wio, *G.* woche, *R.* wiek, ***vicissitude.***
Virtus,	Vṛitya,	excellent,	αρετη, *G.* werth, *Go.* wairtha, *Ga.* feart, ***virtuous***, *F.* [virtuel.
Vanus,	U'na,	less,	ευνις, *Go.* wans, *G.* wahn, *Li.* wienas, ανευ, ***vanity.***
Viginti,	Vinshati, 3,	twentieth,	*G.* zwanzig, *R.* dwadesiat, *Ga.* fichid, *C.* ugain.
Virgo.	Víṛá.	woman,	*Li.* wyrene, *C.* wraig, ***virgin***, *F.* virginal.

ENGLISH.	SANSKRIT.	MEANING.	COGNATES.
Ax,	Ashri,	edge of a sword,	ακις, *L.* acus, *G.* axt, οξυς, *S.* acse, *Li.* aseia.
Alley,	A'vali,	row,	*F. allée.*
Another,	Anyatara, 28,	other,	*C.* allan, αλλος, *G.* ander, *Li.* anas, εννεοι, *G.* hinter.
Ape,	Kapi,	monkey,	*P. kappi, G.* affe.
Arrow,	Shara,	arrow,	*S. arrewe.*
Away.	Ava,	from,	ου, *L.* ve, *R.* wy, ουχι, ειμι.
Ache,	Agha, 5,	pain,	αχος, *G.* ach, *C.* och, *S.* ace.
Bake,	Pakwa,	cooked,	βεκκος, *P.* pazad, *Ga.* bacalta.
Bask,	Bhaskara,	the sun,	*G.* backen.
Bath,	Váḍ, 4,	bathe,	*S. bad,* βαπτω, *Ga.* baidh, *R.* banya.
Be,	Bhú, 127,	exist,	φυω, *W.* bu, *Ga.* bu, *P.* buden, *R.* bywain, *C.* bun, *S.* [bio.
Beg,	Bhikshá, 17,	begging,	πτωχος, *L.* posco, *Li.* bedzius, *R.* ubogü.
Better.	Bhadra, 22,	excellent,	*Go.* bats, *G.* besser, *P.* bahtar, *S.* betre.
Bid,	Vad, 2,	speak,	*L.* peto, *Go.* bidia, *S.* biddan, *Ga.* bita, *W.* gwed.
Booty,	Bhaṭa,	soldier,	βιαζω, *F.* butin, *G.* beute.
Bold,	Vala, 5,	army,	*L.* polleo, *G.* bald.
Bray,	Brú,	speak,	βρυω, *L.* burrio, *G.* brause, *F.* bruis.
Brother,	Bhrátṛi,	brother,	φρατηρ, *L.* frater, *S.* broder, βρυω, *G.* bruder.
Brow,	Bhrú,	eyebrow,	οφρυς, *S.* browa, *Ga.* bruach.
Bald,	Palit,	grey-haired,	πολιος, *L.* palleo, *Li.* baltas, *R.* bielyi.
Bit,	Bhid,	split,	*Bait,* φαζω, *L.* fodio, *G.* beisse, *F.* fends, *A.* bit, *S.* bita.
Bend,	Bhugna,	bowed,	*L.* pandus, *S.* bendan, *P.* bandan.

ENGLISH.	SANSKRIT.	MEANING.	COGNATES.
Bride,	Bhárjyá,	wife,	παρθη, *L.* parta, *Go.* braths, *G.* braut, *F.* bru.
Bind,	Bandha, 25,	fasten,	πεδαω, *F.* pedio, *Go.* bandi, *G.* binde, *P.* bandah, *H.* abhnet.
Beat,	Bádh 7,	oppose,	πατεω, βακτρον, *L.* batuo, *Li.* badau, *R.* bodu, *C.* baeddu.
Buck,	Bukka,	goat,	βηκον, *G.* bock, *C.* bwch, *buck*, *F.* bouc.
Bleat,	Valh,	speak,	βληχαω, *L.* balo, *G.* blöke, *Li.* blauju, *R.* bleiu.
Bow,	Bhuj, 33,	bend,	πτυσσω, *C.* bachu, πυξ, *G.* bogen, *Go.* biuga.
Break,	Bhrash,	fall,	*L.* frango, *Go.* brika, *G.* breche, πριζω.
Blaze,	Bhlásh,	shine,	*L.* fùlgeo, φλεξω, *Li.* blizgu, *S.* blase.
Bad,	Vádh,	give pain,	*L.* pestis, *G.* bös, *Li.* beda, *R.* bies, *F.* pis, *S.* beado, *P.* bada.
Blow,	Phull,	flower,	*G.* bhühe, φλαω, *L.* flo.
Bang,	Bhanj,	break,	*Go.* brikan.
Carve,	Charv,	eat,	*L.* carpo, καρπιζω, *G.* kerbeen, *Li.* kerpu.
Caw,	Kávádа,	indistinct sound,	χαω.
Champ,	Cham,	eat,	καπτω, *F.* champayer.
Chant,	Gána,	song,	*L.* cantus, *accent*, *C.* canu, *Ga.* canam, *W.* kan.
Churn,	Chúrna 15,	grind,	γυρωμα, *S.* cerene.
Coal,	Kála, 86,	black,	*L.* caleo, *G.* kohle, *S.* col, *H.* gachel, *La.* gual, *R.* ugol.
Come,	Gam, 18,	go,	κομεω, *Go.* quima, *G.* komme.
Coo,	Ku, 1,	cry as a bird,	
Cottage,	Kuti, 24,	house,	*L.* casa, ***hut***, *C.* cwtt, κοιτη, κευθω, *Ga.* cot.
Cow,	Gao, 112,	cow,	*G.* kuh, *L.* ceva, *P.* gav, *S.* cu, *H.* gagyah, *Ga.* ceo.

ENGLISH.	SANSKRIT.	MEANING.	COGNATES.
Crow,	Karata,	crow,	κοραξ, *L.* corvus, *G.* krähe *R.* gracz.
Cud,	Kḍu,	eat,	*S.* cud, *chewed.*
Chin,	Hanu, 5,	jaw,	γενυς, *G.* kinn, *Go.* kinnus, *P.* chánah.
Carry,	Char, 24,	go,	*L.* curro, χωρεω, ***chair***, *S.* cyran, ***car.***
Chalice,	Kalasha,	water jár,	κυλιξ, *L.* calix, *F.* calice, *S.* calie.
Curl,	Kurula,	lock of hair,	γυρος, *S.* cyrran.
Comely,	Komala, 3,	beautiful,	κοσμος, *L.* comis, *S.* cweman.
Cull,	Khal,	gather,	*F.* cueillir, *collect,* λεγω.
Cheat,	Cháṭa, 4,	rogue,	*F.* acheter, *S.* cetta.
Cool,	Jala,	cold,	*L.* gelu, *G.* kalt, *L.* szaltas, ***chill***, *F.* gele, *R.* cholozu.
Cut,	Kvit, 4,	cut,	*L.* quatio, *G.* kutte, *C.* cadu, *R.* kroiu, *Li.* kertu, ***card.***
Cough,	Kása, 6,	cough,	κοιζω, *G.* keiche, *Li.* kostu, *R.* kaszliau.
Chuckle,	Kakkh, 2,	laugh,	καχαζω, *L.* cachinnor, *G.* kichele. *R.* chikaiu.
Cry,	Kur,	sound,	*G.* krähen, *C.* criu, *L.* queror, καρυω, *F.* crie.
Carp,	Kṛip,	weak,	*L.* carpo, *G.* kerbe, καρπιζω.
Chop,	Chap, 2,	pound,	κοπτω, *G.* kappe, *F.* coupe, *Li.* kapoiu, *R.* kopaiu.
Camel,	Kramela,	camel,	καμηλος, *G.* kamel, *L.* camelus, *F.* chameau, *H.* gámál.
Cock,	Kukkuṭa, 2,	cock,	*C.* cok, κικκος, *G.* göekel, *R.* koczet.
Cuckoo,	Kokila, 4,	cuckoo,	κοκκυξ, *G.* guckuck, *L.* cuculus, *R.* kokuszka.
Claw,	Kuli,	hand,	χηλη, *G.* klaue.
Censor,	Dhwans, 6,	calumniate,	*G.* sinne, κηνσος, ***censure***, *H.* kásas.
Cup,	Kúpí, 3,	bottle,	κυφος, *G.* kufe, *C.* cib, *L.* cymba, ***coop***, *R.* kub.
Char,	Chur,	burn,	ξηρος.

ENGLISH.	SANSKRIT.	MEANING.	COGNATES.
Dame,	Dam,	wife,	δαμαρ, *L.* domina, *F.* dame.
Dale,	Dal,	division,	*G.* theile, *R.* dieliu, *Li.* dallyiu, *Go.* dailia.
Damp,	Dhúma, 22,	smoke,	θυμος, *G.* dampf, *Li.* dussa, τυφος.
Dare,	Dhrish, 11,	confident,	*Go.* dar, *G.* traue, *Li.* drystu, *R.* derzai.
Daughter,	Duhitṛi, 2,	daughter,	θυγατηρ, *Li.* dukti, *P.* dokhter, *G.* tochter, *R.* docza.
Dead,	Tud,	kill,	θανω, *Go.* dauths, *G.* todt, *Ga.* todhas, *R.* dad, *S.* dydan.
Deal,	Dal, 25,	divide,	θλαω, *G.* theil, *Li.* dalis, *C.* tylla, *dole*, *S.* dælan, *Ga.* dailim, *H.* dal.
Doubt,	Dwaidha,	two ways,	*L.* dŭbius, *F.* doubte, *Ga.* dubhátai.
Drive,	Tarv,	move,	τρεπω, *L.* trepido, *Go.* drieba, *G.* treibe.
Dug,	Dugdha, 13,	milk,	*C.* degga.
Dupe,	Dambha,	deceit,	*F.* dupe.
Dust,	Tústa,	dust,	*S.* dust, *Ga.* duust.
Daunt,	Dánta, 2,	subjection,	*F.* dompter, *L.* domitare, δειματοω.
Dash,	Dásh,	hurt,	δαζομαι, *H.* dush. [*R.* dium.
Dim,	Tamas, 30,	darkness,	*G.* dämmere, *L.* tenebræ, *S.* dim, *P.* damah, *Ga.* deimhe,
Druid,	Dhíra, 14,	wise,	*S.* drua, *Ga.* druidh.
Dip,	Tip,	sprinkle,	δυπτω, *G.* taufe, *S.* dippan, *dive*, *R.* topnu, *dip*.
Dad,	Táta, 5,	father,	*C.* tád, *W.* tát, τεττα, *L.* tata, *L.* tewas, *R.* tiatia, [*H.* dod.
End,	Anta, 37,	final,	*G.* ende, *Go.* andeis, *S.* ende.
Ewe,	Avi, 2,	sheep,	*L.* ovis, οἶς, *Ga.* avi, *R.* ovtsa, *ovation*, *S.* eowa. [oculus.
Eye,	Akshi, 10,	eye,	*G.* auge, *C.* aug, *Go.* augo, *R.* oko, *S.* eage, αυγη, *L.*

ENGLISH.	SANSKRIT	MEANING.	COGNATES.
East,	U'shá, 42,	daybreak,	εως, *S.* eost, *Ga.* heos, *G.* ost.
Even,	Iva,	even,	*G.* ebung, *Ga.* e, *yea*, *R.* ei, *G.* ja, *L.* jam, *Go.* ja
First,	Purastát,	before,	φεριστος.
Five,	Panchan, 100,	five,	*S.* fif. *L.* pente, *P.* punge, *R.* pyate, *C.* pump.
Flee,	Paláy, 20,	retreat,	*G.* fliehen, πλεω.
Flood,	Pluta,	plunge,	πλωτος, *G.* flüss, *Ga.* fliuch, *R.* plywre, *Li.* plauju.
Foal,	Pál,	cherish,	πωλος, *Go.* fula, *S.* fula.
Foot,	Paḍ, 106,	foot,	φοιταω, *S.* fot, *Ga.* fuidh, *G.* pfote.
Feud,	Yudh, 17,	war,	*S.* fedh, *foe.*
Far,	Pára,	end,	πορρω, *S.* feor, *Ga.* fatt.
Fan,	Váyu,	wind,	*L.* vannus, *winnow*, *R.* vieyanie.
Fell,	Phal, 1,	split,	βαλλω, *G.* fellen, *H.* yipel.
Find,	Vind, 1,	find,	*S.* findan, *G.* *be*finden.
Foam,	Phena, 11,	froth,	*S.* fam, *L.* fumus, θυειν.
Gad,	Gata,	gone,	κιω, *L.* cio, *Go.* ganga, *G.* geh.
Glad,	Hlád, 3,	delight,	χλιω, *G.* geil, *P.* shed, *L.* hilaro, *S.* glæd.
Glout,	Gláyat,	exhausted,	*Glee*, *S.* gligge.
Gloom,	Gláni,	languor,	*S.* glomang, *L.* lumen.
Go,	Gá,	go,	κιω, *Go.* ganga, *L.* cio, *G.* gehe, *R.* chozu, *W.* camu.
Greedy,	Gridh, 6,	desire eagerly,	χραω, *L.* quæro, *G.* gehre, *Go.* gredo, *Li.* gardus.
Grave,	Gaurava, 33,	heavy,	*L.* gravis, *F.* grave, *R.* pogebraue.
Gripe,	Grah, 78,	seize,	γραω, *G.* gréifen, *P.* gériften, *Go.* gréipan, *S.* gripon, *F.* gripper.

ENGLISH.	SANSKRIT.	MEANING.	COGNATES.
Grunt,	Garjana, 8,	deep sound,	*L.* grunnio, *S.* grennian.
Gullet,	Gala, 11,	throat,	*L.* collum, *G.* kehle, *L.* gula, *P.* galu, *R.* glotaiu.
Graze,	Gras,	eat,	γραω, *Li.* grauzu, *R.* gryzu, *S.* grasian, *G.* gras, *P.* gryah.
Gush,	Ghas,	sprinkle,	χυσαι, *G.* giessen, *H.* gáâsh.
God,	Shudh, 18,	pure,	κασθεις, *L.* castus, *S.* god, *G.* gott.
Glow,	Jwal, 14,	burning,	κηλοω, *G.* glühe, *Li.* szylu, *R.* kalu, *F.* chaleur.
Gorge,	Kṛika, 8,	throat,	*L.* gurges, γαργαρεων, *gurgle*, *G.* gurgel, *R.* gorlo.
Gate,	Ghaṭṭa,	ghat,	*Go.* gatwo, *G.* gasse, *R.* chod.
Great,	Kṛita,	sufficient,	*G.* gross, *S.* great.
Grist,	Ghrishta, 4,	ground,	*S.* grist.
Hall,	Shálá, 9,	hall,	αυλη, *L.* cella, κολεος, *G.* halle, *hull*, *R.* kelia, *R.* [zala.
Have,	A'p, 8,	obtain,	απτω, *L.* apiscor, *G.* haben, *S.* habban.
Heart,	Hṛid, 27,	heart,	*Go.* hairto, *G.* herz, *Li.* szirdis, καρδια, *R.* serdce, *Ga.* [criodhe.
Hie,	Hay, 1,	move,	κιω, *L.* eo, *S.* hiegan.
Ho,	Há,	ha,	*L.* eho.
Horse,	Ashwa, 50,	horse,	*Ga.* each, *P.* asb, *G.* ross, *Li.* azwa, ικκος, *F.* hacque, [*W.* osw, *Z.* aspo.
Hurt,	Aṛdati, 1,	pain,	*F.* heurter, *S.* hyrt.
Hut,	Kut, 1,	house,	κευθος, *G.* hütte, *R.* kutain, *C.* cuddiu, *L.* casa, *Go.* [hus, *P.* kad.
Hit,	Hata, 54,	struck,	*L.* ictus, *Go.* hintha, κεντεω.
Heat,	Iddha, 3,	blazing,	αιθος, *G.* heiss, *L.* æstus, *Ga.* aodh, *C.* ete.
Hide,	Kuḍi, 35,	body,	*L.* cutis, σκυτος, *G.* haut, *coat.*
Hiss,	Hása, 8,	laughter,	σιζω, *S.* hircean.

ENGLISH.	SANSKRIT.	MEANING.	COGNATES
Harry,	Hṛi, 7,	seize,	*F.* harer, *S.* hergian.
Hate,	Haṭha, 4,	violence,	κοτεων, *G.* hassend, *Go.* hatands, *F.* hais, ατη, *S.* ade.
Horn,	Shringa, 10,	horn,	κορωνη, *L.* cornu, *Go.* haurn, *G.* horn, *H.* qeren.
Hand,	Hasta, 11,	hand,	*G.* hand, *Go.* handus, *P.* dast, *G.* tasten,
Hilarity,	Hil, 1,	dally,	χλιω, ιλαρος, *L.* hilaris.
In,	Ni,	within,	εν, *L.* in, *Go.* in, *G.* in, *Li.* i, *C.* yn.
It,	Etad,	it,	*L. id.*
Joke,	Jaksh,	laugh,	ιαχω, *G.* juchze, *Li.* jukin, *L.* jocor, *F.* joue, *H.* tsáchak.
Jabber,	Jap, 14,	mutter,	*Gibberish*, *P.* ghab, *S.* gabban.
Joy,	Jush, 5,	pleasure,	γηθος, *L.* gaudeo, *Go.* kiusa, *F.* gai, *H.* tsáhal.
Keep,	Gup, 35,	hide,	σκεπω, *cap*, *L.* capio, *G.* hebe, *Li.* kaupoiu, *R.* kopliu.
Kiss,	Kush,	embrace,	κυω; *Go.* kukia, *W.* cusanu, *G.* küss.
Knit,	Nah,	bind,	νεω, *L.* nodus, *net*, *C.* neut, *R.* nit, *G.* naht, *S.* gnittan.
Kin,	Jana, 95,	mankind,	*Go.* kuni, *Li.* gymis, *kind*.
Lazy,	Alasa, 4,	idle,	χαλαζω, *L.* laxus.
Less,	Leshi, 5,	lessen,	λιαζω, *lose*, *Go.* liusa, *G.* letz, *R.* liszaiu, *Li.* liekmi.
Lick,	Lih, 6,	lick,	λειχω, *L.* lingo, *Go.* laigo, *G.* lecke, *Li.* lezu, *R.* lizu, *Ga.* lighau.
Light,	Laghu,	light,	*Go.* laika, *L.* leger, *G.* leicht, *R.* letaiu.
Lock,	Lagna,	joined to,	*S.* loc.
Look,	Lok, 9,	see,	λευσσω, *W.* lhygad.

ENGLISH	SANSKRIT.	MEANING.	COGNATES.
Lop,	Lup, 20,	cut,	*Li.* luppu, λεπτος, λωβη, *R.* lupliu. [*P.* laheb.
Love,	Lubh, 7,	desire,	*G.* liebe, *S.* luvian, *R.* liubliu, *Go.* liebia, *Li.* lubiju,
Luck,	Lakshmí,	fortune,	λευκος, *G.* glücke, *lucky.*
Lust,	Lása,	embrace,	λαυω, *L.* lætor, *Go.* lusto, *G.* lüste, *S.* lust, *P.* lustan.
Leaven,	Lavana, 4,	salt,	*F.* levain, *leaven.*
Loll,	Lal, 41,	desire,	λιλαιω. [*loose.*
Loose,	Lush, 9,	cut,	λειοω, *L.* laxo, *Go.* lausia, *Li.* lauzu, *R.* lozzu, *G.* löse,
Leap,	Lep,	approach,	*G.* laufe, *Go.* laupa.
Lake,	Luch, 11,	cut,	*L.* lâcus, *G.* loch, *C.* llwch, *R.* luza, *lough*, *F.* lac.
Like,	Lak, 1,	mark,	*Go.* leiks, *like,* λίκος, *G.* lich, *Li.* lygus.
Mad,	Mad, 67,	fool,	ματια, *G* matte. [meshe.
Man,	Mánusha, 11,	man,	*C.* mon, *L.* mas, *G.* mensch, *R.* muz, *Go.* manna, *Z.*
Mead,	Madhu, 32,	intoxicate,	μεθυ, *metheglin*, *W.* medh, *G.* meth, *C.* medd.
Meal,	Mil,	mix,	ομιλια, *S.* male, *R.* meliu.
Mean,	Man,	mind,	μενοιναω, *G.* meinen, *Ga.* mien, *R.* mniu, *A.* manwi.
Month,	Mása, 11,	month,	μην, *Ga.* mios, *R.* miesiac, *Li.* menu, *G.* monath.
More,	Mahattara,	greater,	*S.* mare, *L.* major, *Ga.* mor, *Z.* mae, *A.* emir, *W.* mawr.
Murrain,	Marana, 2,	dying,	μαραινω, *L.* mori.
Mud,	Mṛid,	soil,	μυδαω.
Matter,	Mátrá, 2,	substance,	*L.* materia, *F.* materiel.
Maid,	Mahilá,	female,	*Go.* maevi, *G.* magd.
Member,	Marman, 5,	joint,	μερος, *F.* membre.

ENGLISH.	SANSKRIT.	MEANING.	COGNATES.
Mouth,	Mukh, 36,	mouth,	*G.* mund, *Go.* munths, *F.* museau, μυτις, *S.* median.
Mark,	Maryá, 1,	limit,	*Go.* marka, *G.* mark, *Li.* miera, *C.* marc, *R.* miera, μερος.
Mill,	Malana,	grinding,	μυλη, *L.* mola, *G.* mühle, *Ga.* muileann, *C.* melin, *R.* [meliu. [*S.* mylen.
March,	March,	go,	*G.* marschirn, *F.* marcher.
Male,	Mála, 1,	man,	*L.* masculus, *F.* masculin.
Mate,	Mith,	associate,	*Meet*, μετα.
Nail,	Nakha, 27,	nail,	ονυξ, *G.* nagel, *Li.* nagas, *P.* nakhan, *L.* unguis, *R.* nogot.
Naked,	Nagna, 9,	naked,	*L.* nudus, *Li.* nogas, *Go.* naquaths, *G.* nacket, *R.* nagü.
Neat,	Nad, 1,	shine,	*Go.* nasia, *L.* niteo, *G.* nett, *F.* net.
Nigh,	Nah, 2,	join,	*G.* nach, *Go.* nehwa, *C.* nessu, *L.* nexus, νηθω, *L.* no- [dus, *C.* nes.
No,	Ná, 11,	not,	*W.* na. νη, *L.* ne, *G.* nein, *Li.* ne, *Ga.* nach, G. nicht, *P.* nah, *R.* ne, *S.* no.
Nor,	Nir, 281,	no,	
Nose,	Násá,	nose,	*G.* nase, *Li.* nosis, *R.* nos, *S.* nez, *S.* nœse.
Now,	Nu,	now,	*L.* nunc. *Go.* nu, *Ga.* nois, νυν, *R.* nynie, *P.* nun, *S.* nu.
Nod,	Nata,	shake,	κνωσσω, νευω, *L.* nuto, *W.* amneidis.
Nave,	Nábhi,	wheel,	ομφαλος, *G.* umbo, *G.* nabe.
Neath,	Nícha,	low,	*G.* nieder, *Li.* nú, *R.* niz.
Navel,	Nábhíla,	navel,	*G.* nabel, ομφαλος, *F.* nombril, *L.* umbelicus, *P.* naf, [*S.* nafal.
Nest,	Níḍa, 2,	nest,	*Ga.* nead, *C.* nith, ναος, *G.* nest.
Oar,	Arittra,	rudder,	*S.* are, *L.* aro.

ENGLISH.	SANSKRIT.	MEANING.	COGNATES.
Oh,	Háh, 5,	O!	*O.*
One,	Jana, 95,	person,	*οιον*, *L.* unus, *unity*, *F.* un.
Ooze,	Ghas,	sprinkle,	*F.* eaux, *S.* wæz. *H.* auts.
Other,	Itara,	other,	*S.* oder, *F.* autre, *L.* alter, *H.* âdar. ετερος.
Otter,	Uda,	water,	*S.* oter, *L.* lutra.
Over,	Upari, 5,	above,	*L.* super, *Go.* ufar, *H.* âvar.
Owl,	Ulúka,	owl,	*L.* ulula, ολολυγων, *G.* eule, *howl.*
Ox,	Ukshan, 2,	ox,	*W.* ych. *Ga.* agh, *L.* vacca, *Co.* auhs, *G.* ochs *S.* oxa.
Opium,	Aphena,	opium,	*οπιον*, *P.* afiun, *οπος.*
Outer,	Uttar, 66,	posterior,	*S.* ut, *ωθεω.*
Pass,	Pes,	move,	*πεταω*, *F.* passer, *L.* passus.
Plunge,	Plu,	submerge,	*πλυνειν*, *F.* plonger.
Prayer,	Prárthana,	asking,	*φραστωρ*, *F.* precor, *G.* sprechen, *R.* proszu, *Li.* praszau.
Proud,	Pradhrishta,	arrogant,	*S.* prude.
Pot,	Puta, 7,	vessel,	*ποτος*, *pottage.*
Push,	Push, 1,	rear,	*F.* pousser.
Pretty,	Príta, 11,	satisfied with,	*L.* fruor, *S.* præd.
Paw,	Paní,	the hand,	*L.* puteo, *W.* pawen.
Path,	Pathin, 9,	road,	*L.* spatium, *πατος*, *G.* pfad, *R.* put, *F.* pas, *L.* passus, [*S.* pœth, *P.* pay.
Pile,	Pul,	heap up	*πλεω*, *Li.* pillu, *F.* pile.
Pawn,	Paṇa, 13,	bet,	*ποινη*, *L.* pensum, *G.* pfand, *Li.* pantas.
Pound,	Puṇd,	grind,	*L.* pinso, *Li.* paisau, *πτισσω.*

ENGLISH.	SANSKRIT.	MEANING.	COGNATES.
Quoth,	Katha, 20,	say,	*Go.* quitha, *L.* cedo.
Quill,	Kalama, 3,	reed,	*L.* culmus, *P.* kalam.
Queen,	Jáni,	female,	γυνη, *C.* cena, *Go.* quens.
Quick,	Shak, 14,	power,	*G.* quicke, *Go.* quiws, κικυων.
Rage,	Rajas,	passion,	*L.* rabies, *G.* rasen, ραγα, *H.* rágan.
Rave,	Ráva,	noise,	*F.* rever, *L.* rabies, *G.* rufe, *R.* rewu, ροιβδος.
Read,	Rádh, 2,	speak,	*S.* redan, ραζω, *Go.* rodia, *G.* rede, *R.* reszczi, *C.* reithu.
Red,	Rohita, 4,	red,	*L.* russus, *G.* roth, *Li.* ruddas, *Ga.* ruadh, *C.* rhuddh,
Reign,	Rájan,	sovereign,	*L.* regnum, *F.* regne, *H.* raâh. *S.* regn. [ερευθος, *R.* rumen.
Root,	Rad, 10,	root,	ριζα, *L.* radix.
Rude,	Ruksha, 2,	harsh,	ρυσσος, *L.* raucus, *G.* rauh. *F.* rauque, *rough.*
Racy,	Rasa, 53,	flavor,	*L.* ros, ερση.
Reach,	Rag,	obtain,	*Go.* rika, *Ga.* racham, ρογεω, *G.* reiche, *P.* rasad.
Ray,	Ruchi,	ray,	*L.* radius, *F.* rayon.
Row,	Ráji, 2,	line,	*G.* reihe.
Run,	Riṇa, 2,	oozing,	ραινω, *G.* rinnend, *Go.* runnans. *R.* rownoi.
Sake,	Sakhi,	friend,	*S.* sac, *G.* sache.
Same,	Sama, 550,	similar,	αμα, *Go.* samo.
Seam,	Síman,	limit,	*G.* saum, *S.* seam.
Sew	Svana,	sew,	*Li.* sutas, *L.* satus, *Go.* saija, *G.* sae, *R.* sieiu.
She,	Sá,	she,	*Go.* si, *S.* seo, *R.* ta.
Sign,	Sajnná,	sign,	*F.* signe, *L.* signum, σημειον, *S.* segen.

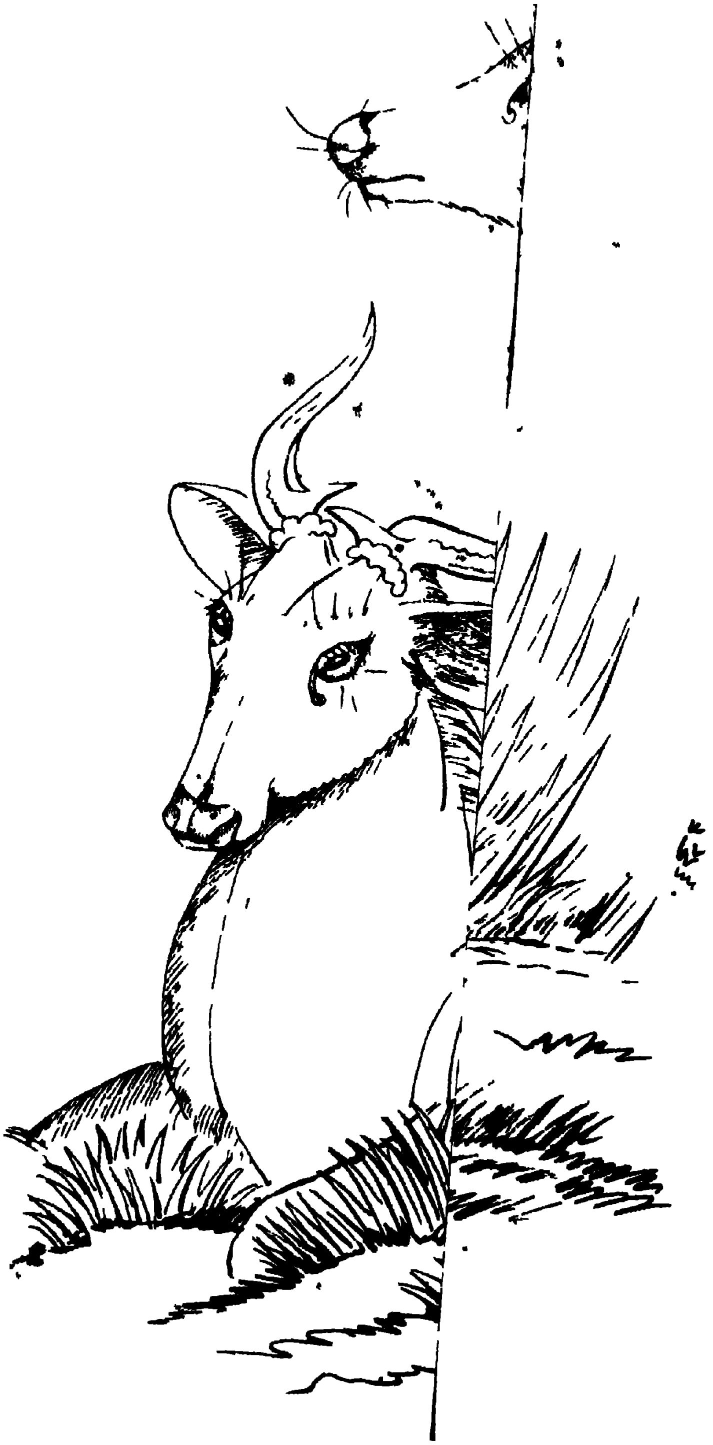
ENGLISH.	SANSKRIT.	MEANING.	COGNATES.
Sister,	Swasṛi,	sister,	*L.* soror, *Go.* swistar, *Li.* sessû, *R.* sestra, C. chwaer, *G.*
Speech,	Vách,	voice,	*S.* spekan. [schwester.
Son,	Súnu, 3,	son,	*Go.* sunus, *G.* sohn, *Li.* sunus, *R.* syn, ινις.
Shear,	Kshura, 11,	razor,	*G.* scherer, *Li.* skirras, ξυρος, κουρευς, *S.* sunu.
Spy,	Spasha, 5,	see,	*L.* specio, *G.* spähen. *Li.* spegas, σκοπος, *F.* espion.
Stall,	Sthala, 10,	place,	*G.* stelle, στελλω, *Li.* stelloju, *R.* steliu.
Stun,	Stan, 2,	groan,	στενω, *G.* stohnen, *Li.* stenu, *R.* steniu.
Sum,	Sama,	whole,	*L.* summus, *F.* somme, *G.* sammle, συν, *Go.* sama.
Sweat,	Sweda,	sweat,	ιδος, *L.* sudor, *G.* schweiss, *F.* sueur, *seethe.*
Sweet,	Swadu, 20,	dainty,	ηδυς, *G.* süss, *L.* suavis, *Li.* saldus, *R.* sladok, *W.* chwys.
Sugar,	Sharkará,	sugar,	σακχαρ, *L.* sachharum, *P.* shakar, *G.* zucker.
Suck,	Sechana,	drip,	*Li.* sunkiu, *L.* sugo, *G.* sauge, *P.* chusad, *R.* sosiu, *H.*
Scour,	Kshur,	scratch,	σκωρ, *G.* schur. [shaqah.
Scar,	Khárí,	scar,	χαραττω, *S.* sciran, εσχαρα.
Sad,	Sáda,	exhaustion,	*S.* suht, *P.* setoh.
Soup,	Súpa,	broth,	σιφωνιζω, *S.* sipan, *sop.*
Sail,	Sel,	move,	*W.* huyl, *Ga.* sêol, *S.* sæglian, *A.* sayl. [*H.* sak.
Sack,	Sajja,	clothed,	σαγη, *L.* saccus, *Li.* sakas, C. sach, *R.* sak, *G.* sack,
Stem,	Stambha,	stalk, 13,	στυμος, *L.* stipes, *Li.* stambas, *R.* stebel, *G.* stab.
Stop,	Stbha, 2,	obstruct,	στειβω, *L.* stipo, *G.* stopfe, *Li.* stimpu, *R.* stupaiu.
Sinew,	Snáyu,	muscle,	ινες, *S.* senwe.
Sorrow,	Swṛi,	pain,	*Sore*, *Go.* saurgan, *S.* sorgian.
Syrup,	Suráp,	vinous liquor,	

ENGLISH.	SANSKRIT.	MEANING.	COGNATES.
Swell,	Sphul,	expand,	*S.* svellan.
Sir,	Sri, 52,	respect,	*F.* sire, *L.* senior.
Sun,	Súnu,	sun,	*G.* sonne, *Go.* sunna, *R.* solnce, C. huan.
Shrub,	Suráp,	drinking spirits,	*L.* sorbeo, *A.* sariba. ροφεω.
Smile,	Smi, 3,	smile,	*G.* schmiele, *R.* smieu, μειδαω.
Scathe,	Skhad, 2,	destroy,	σκεδαω, *G.* schade, *Go.* skathia, *Li.* skaustu.
Snow,	Snav, 2,	oozing,	*Go.* snaiwa, *G.* schnee, *Li.* snegas, *Ga.* sneachd, *R.* snieg, νιξ, *L.* nix.
Sow,	Shúkara,	hog	συς, *L.* sus, *G.* sau, *R.* swinia, *W.* hweh.
Stow,	Styai,	crowd,	*G.* staue, στυω.
Seed,	Súti, 7,	bringing forth,	*Go.* setho, *G.* saat, C. had, σειω, *Li.* seju.
Shell,	Chála,	thatch,	*G.* schale, *shield*, σκυλος.
Steer,	Sthira,	bull,	*G.* stier, *Go.* stiurs, ταυροσ.
Skill,	Shíla,	versed in,	*L.* calleo, *W.* call, σχολη.
Steam,	Stema,	moisture,	ατμη, *S.* steme.
Star,	Tárá,	star,	*L.* stella, *Go.* stairno, *W.* seren, *G.* stern, *P.* sitarah, *S.* [steorra.
Tear,	Dṛí,	pull,	τερην, *L.* tener, *S.* tœran, *P.* tarakidan, *R.* deri.
Teat,	Dayita,	beloved,	τιτθος, *W.* teth, *S.* tit, *F.* teton.
That,	Tad, 40,	it,	*G.* das, το *Ga.* so, *H.* so.
Thirst,	Trish, 11,	thirst,	τερσια, *G.* durst, *Li.* trokstu, *P.* tarzad, *L.* torres.
Thou,	Twam,	thou,	*Ga.* tu, *R.* ty, *G.* du, C. ti, *P.* tu, συ, *Li.* tu, τυ, *Go.* thu.

English.	Sanskrit.	Meaning.	Cognates.
Toss,	Tas,	throw,	*ταζω*, *F.* tasser, *θεωσαι.*
T'other,	Tatara,	the other,	
Tree,	Taru, 20,	tree,	*δρυς*, *Go.* triu, *R.* drewo, *Ga.* doire, C. dar.
Through,	Tṛi,	pass,	*G.* durch, *S.* durr.
True,	Dhruva, 3,	fixed,	*δηρος*, *Go.* trigws, *G.* treu, L. durus, G. daure, *C.* tariu.
Tune,	Tána,	tune,	*G.* töne, *din*, L. tonus, C. ton, *δονεω.*
Touch,	Twach, 8,	cover,	*θιγω*, L. ictus.
There,	Tatra,	there,	*Go.* thatro, *G.* dar, *S.* dær.
Thought,	Dhyáta, 5,	meditate,	G. denke, *Go.* thankia, *Li.* dingau.
Vane,	Váyu,	wind,	L. vannus. *F.* vanne.
Very,	Bhúri, 6,	much,	*ερι*, *F.* vrai.
Vile,	Vilaksha,	vain state,	*φαυλος*, *F.* vil, L. vilis, *H.* hevel.
Upper,	Upari, 4,	above,	*Go.* ufar, *Da.* over, *Swe.* ofre, *υψι*, *G.* auf, *up*, *S.* uppa.
Udder,	Udara, 13,	belly,	*ουθαρ*, L. uterus, *S.* uder, L. uber.
Was,	Vása,	abiding	*G.* wesen, *S.* wesan.
Weave,	Vap, 16,	weave,	*υφαω*, *web*, *G.* weben, *L.* opus, *P.* bafad, L. vibro.
Well,	Válita,	cherish,	*ουλων*, *L.* valeo, *G.* wohl, *R.* welü, C. gwell.
Wed,	Vadhuká,	wife,	*εδνα*, *S.* wedian.
What,	Yad, 48,	what,	*S.* hvæt, *Go.* was, *L.* quid, *H.* hua. [waliu, *Li.* welu.
Wheel,	Gola,	circle,	*S.* hweol, *ειλεω*, *L.* volvo, *Go.* walwia, *G.* walle, *R.*

ENGLISH.	SANSKRIT.	MEANING.	COGNATES.
Wend,	Vanḍ, 1,	surround,	*L.* vitta, *Go.* winda, *G.* winde, *wind.*
Wing,	Vihanga,	going swiftly,	*S.* gewing, *L.* pinna.
Wise,	Vidyá,	knowledge	*Wit,* ειδω, *Go.* wait, *R.* wizu, *C.* wyddu, *Li.* wystu.
Wish,	Ish, 23,	wish,	*G.* heische, *Li.* jeszkau, *Go.* weiha, *P.* az. *L.* egeo, *R.* iszczu, *ask.*
Woman,	Vámá, 13,	woman,	*Go.* wamba, *Ga.* fem, *G.* wamme, *R.* wymia, *L.* femina.
Wrath,	Krodha,	anger,	*εριθω.*
Wound,	Vundh,	hurt,	*ουταω,* *G.* wunde, *Go.* wundo.
Wan,	Vána,	dry,	*S.* wan, *wane,* *C.* gwan.
Waste,	Vasta,	injure,	*αταω,* *L.* vasto, *G.* wúste, *waste,* *H.* bázan.
Wax,	Vaksh,	accumulate,	*αεξω,* *L.* vegeo, *Go.* wahsia, *G.* wachse.
Warm,	Gharma, 10,	heat,	*θερμον,* *P.* garm, *S.* wyrman, *Ga.* garam.
Wriggle,	Vṛijana,	crooked,	*S.* wriggan.
Word,	Vrittam,	read,	*L.* verbum, *Go.* waurd, *Li.* wardas : *G.* wort.
Walk,	Valga, 5,	move,	*S.* wealcan, *G.* walzen, *ελκω,* *Li* welku, *R.* woloku.
War,	Vṛi, 20,	defend,	*G.* wehre, *Go.* waria, *Li.* wyras.
Ween,	Ven,	reflect,	*οιειν,* *S.* wenan, *G.* wahnen, *H.* bun.
Wash,	Uksh,	clean,	*Li.* ukstu, *υγρος,* *υακιζω,* *G.* wasche.
Wolf,	Vṛika,	wolf,	*L.* vulpes, *Li.* wilkas, *αλωπηξ.*
Wall,	Val, 13,	cover,	*ειλαρ,* *L.* vallum, *Li.* wolus, *R.* wal, *G.* wall, *F.* val.
While,	Velá, 2,	time,	*Go.* weila, *G.* weile, *S.* hwile.
White,	Shweta, 46,	white,	*G.* weiss, *Go.* hweits, *καζω,* *L.* castus, *P.* safid, *S.* hwit.

ENGLISH.	SANSKRIT.	MEANING.	COGNATES.
Wagon,	Vahana, 4,	vehicle,	*G.* wagen, *R.* wezenie, *L.* vehiculum.
Way,	Vega, 13,	speed, 13,	*G.* wege, *S.* wæg, βαω, *L.* via, *voyage*, *H.* boa.
Whisk,	Vaska, 3,	motion, 3,	βασκω, *G.* wischen.
Yoke,	Yugya, 30,	fit to be harnessed,	*P.* yugh, ζευγος, *W.* jau, *Ga.* kuing, *S.* ioc, *R.* igo, *Go.* juka.
Young,	Yuvan,	youth,	*S.* jong, ηιθεος.
Yea,	Iva,	so,	η, *Go.* ja, *Ga.* ja, *R.* ei, *Ga.* e, *C.* efe, *F.* oui.



On a new species of Cervus, CERVUS DIMORPHÉ. *By* B. H. HODGSON, ESQ. *Resident, Kathmandoo. With a Plate.*

In January last, I procured from the Saul forest of the Morung, a young Stag rising two years, having horns of an unique character, and a stature and other attributes seeming to place him between the Axines and Rusans. I considered this animal to belong to a new species, but, as he was young and had the horns imperfect, I determined to wait awhile before noticing him to the Society. The animal since his arrival has lived and flourished in my stable. He is now nearly three years old, and his horns are perfect; but his pelage in course of moult or change. I will not not, however, longer defer giving you a summary description and sketch of what I apprehend to be an undescribed, though large and handsome species of Deer. This animal, like Cervus Wallichii, and Cervus Elaphoïdes vel Duvancellii, possesses a mixed character, so that I hesitate to class it with any known group at present, and shall merely indicate this attribute by assigning to it the trivial name of Dimorphé. My specimen has been reared in confinement: yet it approaches the Rusans in size and stature, but retains in youth at least a good deal of the graceful Axine type. Its horns are small, owing to confinement perhaps, and it is possible that maturer age may develope more snags or antlers. At present there is but one on each beam, and it has a very forward direction, as in Elaphus and our Affinis, species to which the present one is also allied by its short tail and moderate suborbitar sinus.

Cervus Dimorphé, Mihi, new. Deer with moderate pale smooth horns, Axine in the general style, but more bent in the middle of the beam, more divergent and possessed of only one basal antler, which is directed very forward; small, or moderate, and vertical suborbital sinuses; interdigital pores; broad spreading ears and short stag-like tail. Stature and aspect mediate between the Axines and Rusans. In youth bright fawn-red, spotted with white; in age nigrescent bay with blackish neck and belly; a dark list round the muzzle, and white chin: limbs pale. Habitat the Saul forest.

Nepal, October, 1843.

Note on the " Flata Limbata," and the White Wax of China. By Capt. THOMAS HUTTON, *B. N. I*

This insect occurs abundantly a little above Rajpore, extending along the jungles at the base of the mountains; the larva is of a pale brown, but this colour is completely hidden beneath a coating of pure white cottony down and powder, with which the whole body is thickly covered; from the tail or anal segment of the abdomen springs a thick tuft or brush of pure white down, which in a state of quiescence, remains horizontally extended posteriorly, but which the insect has the power of erecting and spreading out, so as to cover the whole of its back. These cottony appendages are curled or crisped at the ends, and when erected have precisely the appearance presented by the cut and curly ends of a root of celery when prepared for the table. The larva is furnished, like the perfect insect, with an inflected proboscis; the antennæ are also similar in both, being composed of three joints, of which the two basal ones are thick, strong and cylindrical, the second or middle joint being the longest, and the third or apical joint is a mere seta or bristle. The eyes of the larva are black, and it is from beneath them, and a little anteriorly, that the antennæ spring. The hind pair of legs have three short spines, the others are unarmed; the foot terminates in a double hook; and in these respects also the larva and image correspond, except that the hind legs in the latter have no spines. The perfect insect is furnished with four wings, the under pair being pure white, and the upper pair or elytra of a beautiful apple green, bordered anteriorly with red; the abdomen is powdered with white cottony down as in the larva, and the last segment is furnished with a thick tuft of the same substance. The larva of this species is abundant on a certain shrub growing in the jungly tracts a little above the base of the mountains; they come forth from the ova in December, clustering round the stems and stalks of the branches and leaves, and even on the back of the leaves themselves. They deposit upon the branches a waxy substance of a pure white colour, in small grains of various sizes, and sometimes the branch becomes thickly encrusted with the substance; it is, however, more especially upon the leaves of the shrub that the wax accumulates, and this is so thickly laid on, and becomes so firm from exposure to the atmosphere, that it may be pared off with a knife in thick scales or shavings, having very much the appearance of true wax. The taste is sweet, and the scales may, when fresh, be moulded into balls by the fingers. The reason why it accumulates so much on the leaves is simply from their catching the liquid drops which fall from the hundreds of larva clustering around the stems above.

This wax-like substance appears to be the excrement of the larva, and as it falls from them it is caught and collected upon the surface of the leaves, which at first appear to be only slightly sprinkled with moisture, and have a shining appearance like that caused by certain species of aphides. The liquid dropped is at first sticky to the touch, and sweet in taste; the leaves appearing to be thinly bedewed with honey; this gradually accumulates, and as it passes from a liquid to a solid state, appears like a thick coating of wax upon the leaves, but as it dries by exposure to the sun and atmosphere, it hardens into a snowy white brittle substance, giving the tree the appearance of being *white-washed*, or frosted over with white sugar, like the top of a Twelfth Night cake. It then cracks and falls in pieces to the ground, where it soon dissolves from rain and dews, and is lost.

The larva cluster so thickly round the stems of the shrubs which they frequent, as to give them the appearance of being loaded with snow, and the moment the tree is shaken, they spring off with a sudden jerk in all directions; when in motion, they erect the caudal appendage or cottony tail.

Some of the mature insects remain on the trees even after the larva are hatched, and I have taken many both in January and February; the green colour of the elytra had, however, given place to a faded yellow tinge like a withered leaf, and the insects were in a semi-lethargic state.

The larva appears in December or beginning of January, and gradually increases in size until the period of the rains, that is, until the middle of June, when they change to the perfect insect, and no more wax is deposited. This substance increases in quantity as the larva increases in size, but as it readily dissolves in water, it disappears entirely as soon as the rains have set in. The larva shews no rudiments of wings until its last moult, in which stage Donovan has figured the larva of *F. nigricornis*.

The last change being completed, the perfect insect now assumes the place of the larva, and clusters in hundreds around the stems of the same shrubs that nourished it through its immature stages, and instead of the snowy aspect which they formerly wore, the twigs are now, as it were, encircled by small green leaves or fruit.

I have never seen the Flata Limbata in motion unless when disturbed. They appear to pass their lives in a state of inactivity, merely moving round the stems of the shrubs, and never willingly leaving them until disturbed, when they spring off with a sudden hop, as the larva did before them, and like them, although dispersed far and wide, they gradually make their way back to the twigs of their favorite bushes.

The eggs are deposited within the twigs of the shrubs, which are punctured in patches of about one inch in length all round the stem, which frequently bears four or five of these nests; the places of deposit are detected by a slight swelling of the wood.

It is stated in Westwood's edition of Donovan's insects of China, that the wax deposited by the "*Flata nigricornis,*" has been supposed to be the excrement of the insect, but that such is not in reality the case. I am of opinion, however, that the supposition is correct, and that the wax-like substance is nothing more than an accumulation of the fæces dropped in a liquid state from the larva, and I am strengthened in this belief from observing, that a perfect shower of minute liquid drops descends at intervals from the clusters of larva, and that these drops after accumulating and partially drying, are converted into the waxy state from which it is supposed wax candles are made, and which furnishes the famous white wax of the Chinese Empire. It has been suggested, that the liquid drops are an exudation from the punctured branches of the tree, but this I think is impossible; because in the first place, the drops of liquid are so minute and so sticky, that they would not have weight enough to cause them to detach themselves from the punctured stems; and secondly, because the larva are so closely clustered together round the stems, that any juices dropping from the tree, would never reach the ground, but must inevitably be intercepted by, and accumulated upon the bodies of the larva, which would thereby be destroyed. From these observations I am of opinion, that the liquid is the excrement of the larva, and it appears to differ very little from the white powder and anal canopy of white cottony down with which the insect is loaded.

Kirby and Spence seem to think it very doubtful whether the Chinese wax is in reality the produce of the "*Flata limbata;*" and remark, that as Sir G. Staunton merely *supposes* that such is the case, and as he does not appear to have tried the experiment of dissolving the wax in oil, there is more reason to believe, that the white wax of China is the produce of a totally different species. In this opinion I most fully concur, from the results of experiments made on the wax-like substance procured from the "*Flata limbata.*"

Westwood refers the wax to the "*Flata nigricornis*" of China, and states that the *F. limbata* inhabits Ceylon. Cramer, who figures both insects, gives Ceylon as the *habitat* of *F. limbata*, but assigns Africa as that of *F. nigricornis;* the specimen of the latter however, figured in Donovan's Insects of China, is said to have been taken from India. It is probable, therefore, that *F. limbata* may occur in Ceylon, India and China, and that *F. nigricornis* may likewise be found in the two latter countries, for Chinese forms are exceedingly common in this part of India, and this season I have captured both the Chinese Atlas Moth (*Saturnia Atlas,*) and two fine specimens of "*Buprestis bicolor,*" said to be an inhabitant of Java.* I have likewise a species of Flata agreeing in all respects with *F. nigricornis*, except in wanting the row of black dots along the posterior margin of the elytra.

The newly-deposited wax of *Flata limbata* I found to dissolve readily in water, and when boiled and allowed to cool, a deposit of clear white crystals was formed in the vessel; these had no taste, and felt gritty in the mouth. On trying to dissolve this deposit in warm or even in boiling oil, no combination of the two took place, nor was I more successful in my endeavours to dissolve the crude wax in oil; while the attempt to melt it on the fire without water or oil proved altogether abortive, the wax merely burning and consuming away till it became converted into a hard and baked substance. Melted in water, the mixture assumed a brownish hue with strong arcmatic scent. Thus all my endeavours to convert the substance into wax for economical purposes, according to the directions given in Westwood's edition of Donovan's Insects of China, failed most completely, thereby proving the doubts of Messrs. Kirby and Spence to be well founded, and clearly shewing, that the article termed the white wax of China, is not the produce of the "*Flata limbata.*"

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* Mr. W. H. Benson also possesses a specimen of *B. bicolor*, taken here some years since.

Regarding the Chinese wax, Du Halde informs us in his 'Histoire de la Chine,' that "Il y en a qui disent que c'est la fiente de ces insectes qui s'attachant a l'arbre forme cette cire, *mais ils se trompent.*" (Westwood's Donovan's Insects of China, p. 41.) Notwithstanding this assertion, I am of opinion that if Du Halde refers to F. limbata, he is himself in error, and that the wax-like substance produced by that species, which Kirby declares to be the Chinese insect adverted to, is nothing more, as I have above stated than the fæces of the larvæ. Is it, however, fully ascertained that the species of insect referred to by the above named author, is really the *F. limbata,* or even the *F. nigricornis,* as stated by Donovan? This at least is certain, namely, that if the wax of the Chinese insect is soluble in warm oil, as Du Halde and Sir G. Staunton have declared it to be, it cannot possibly be the produce of the *F. limbata,* for I have shewn already by experiments, that the produce of that species is altogether *insoluble* in oil.* Besides this, Du Halde relates that, "after melting and straining the wax, it is thrown into cold water, where it congeals into small cakes." This too will not hold good with respect to the wax of *F. limbata,* for after melting it on the fire and immersing it in cold water, a precipitation of beautiful small clear crystals is produced, instead of cakes of wax. Neither will the substance melt on the fire, nor combine with oil, like true wax, but requires the aid of water to dissolve it.

It is not improbable that Sir George Staunton may have supposed this species to be the true wax insect, from the mere circumstance of its producing a *wax-like* substance on the branches and leaves of the shrubs on which it feeds, for he does not say positively that he had ascertained it to be the fact, but merely that the powder was *supposed* to form the white wax of the East.

The Abbé Grosier's account of the wax insect can moreover in no way be made to apply to the larva either of *F. nigricornis* or *F. limbata;* for he states, that the tumours on the branches "increase until they are as big as a walnut, and that those nests are the abdomens of females, filled with the eggs which are to give birth to the cocci, which when hatched, disperse themselves over the leaves and *perforate the bark under which they retire,*" and that the wax is afterwards "*perceived rising from the bark round the body of the insect.*, (vide Kirby and Spence, vol. 1. p. 327.) Now as already stated above, the eggs of *F. limbata* are deposited in the branches of the tree, the bark of which is perforated or punctured all round quite closely in longitudinal rows to the length of about one inch; their presence being indicated by a very slight intermescence of the wounded parts. When the larva are hatched they *come forth from beneath the bark,* and cluster in hundreds around the stems and twigs, living thenceforward unconcealed, and depositing a liquid shower upon the leaves beneath their resting places, which as it hardens in the air, assumes a wax-like appearance, and eventually becomes pure white like hoar frost, when it cracks and falls to the ground in pieces of various size and thickness, and is soon incorporated with the dust.

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* Unless some peculiar kind of oil may possess the power of dissolving it?

From all these statements, therefore, we arrive at the positive conclusion, that as this deposit will neither melt on the fire *per se,* nor combine with oil, it cannot be the substance from which the famous white wax of China is formed; and we are led to perceive from the difference in the habits of the larva of *Flata limbata,* and that of the insect mentioned by the Abbé Grosier, that the wax is rather the produce of a species of coccus than of the larva of *Flata limbata,* or even of the allied *F. nigricornis.*

Specimens of the wax are sent for analysis:—

No. 1. The crude fresh wax as gathered from the leaves.

No. 2. Is the wax after drying from exposure to the air.

No. 3. Is the deposit of crystals on the cooling of No. 1. Dissolved on the fire with water.

No. 4. Is a specimen of "*Flata limbata.*"

Should the wax, after analysis, be found of any use, either medicinally or otherwise, it can be collected in considerable quantity from January till June.

THOMAS HUTTON, *Captain,*
Bengal Army.

Mussooree, 15*th August,* 1843.

Qualitative Examination of the Native Copper found on Round Island in the Cheduba group South East of Ramree, and forwarded to the Society by Captain Campbell, *See Proceedings Asiatic Society for April* 1843. *By* S. Mornay, Esq.

H. Torrens, Esq., *Secretary of the Asiatic Society of India.*

My dear Sir,—I have great pleasure in handing you the result of the examination I have made, at your suggestion, of the Copper from Flat Island.

My own business has occupied me so much lately, that I have had very little spare time to give to the investigation, or I should have finished it much sooner. Your most obdt. servt.

S. Mornay.

A qualitative Analysis of Native Copper found on Flat Island, in the Bay of Bengal.

A piece digested with heat in dilute Sulphuric Acid for several days, left a grey powder undissolved, (residuum No. 1.) The solution was pale blue, precipitated with Bi-carbonate of Ammonia, and re-dissolved, all the soluble part of the precipitate with Caustic Ammonia.

In the undissolved part found globules of *Mercury*, separated them and dissolved the rest in cold Muriatic Acid. The solution was greenish yellow: neither boiling nor diluting with water made any alteration. This solution was affected by reagents, as follows:—

Caustic Potash—White, permanent.
Caustic Ammonia—White, ditto.
Carb. of Soda—Snow white.
Hyd. Sulp. of Amm.—Green black.
Ferro-chyaz. of Potash—Dark blue (whole mass coagulated.) In some experiments this reagent merely changed the color of the solution to a dark olive green, owing to the acidity of the solution.
Tincture of Galls—Brown,

it therefore contained *Titanium.*

The above-mentioned solution in Caustic Ammonia evaporated to crystallization, gave beautiful blue crystals; those dissolved in water, behaved as follows:—

Caustic Potash—Pale blue, permanent.
Ditto Ammonia—Pale blue, flocculent: in excess of Ammonia, soluble with the beautiful blue color characteristic of Copper
Carb. of Soda—Pale blue green, permanent.
Bi-carb. of Ammonia—Pale blue: in excess soluble with the same blue color, as above.
Hyd. Sulp. of Ammonia—Black.
Ferro-chyaz. of Potash—Brick red.
Tincture of Galls—No re-action.
Mur. of Barytes—Dense white.

they were therefore pure Sulphate of *Copper*.

Residuum No. 1, melted by the blow-pipe, in the oxidizing flame with Borax and Phosph. of Soda, gave a limpid gloss: but in the reducing flame, at the moment of cooling it assumed a beautiful garnet color, which was permanent, till the bead was fused again in the oxidizing flame, when it became limpid. When much of the oxide was used, the lead assumed a clear black instead of the garnet color.

In some experiments, the color was dirty brown, but a little tin added, immediately purified the color.

These two experiments prove the presence of Titanium and a little *Iron*.

Residuum No. 1, digested in Muriatic Acid, cold. (At the bottom of the vessel, appeared small limpid crystalline scales, brilliant as the diamond.)

The solution behaved as follows:—

Caustic Potash—White, permanent.
Ditto Ammonia—Ditto ditto.
Carb. of Soda—Ditto ditto, (very voluminous.)
Hyd. Sulp. of Ammonia—Black.
Ferro-chyaz. Potash—Emerald green. (In three days turned opaque dark blue and deposited.)
Tincture of Galls—Brown.

Titanium again:

The bright scales dissolved in slightly acidulated water:—

Caustic Potash—White, soluble in excess.
Ditto Ammonia—Ditto, permanent.
Carb. of Soda—ditto ditto, (dense white.)
Hyd. Sulp. of Ammonia—Black.
Ferro-chyaz. Potash—White.
Tincture of Galls—Pale brown.
Sulp. Acid—Dense white.
Nitrate of Silver—Ditto. ditto, flocculent.

they were therefore Muriate of Lead.

In one experiment, another piece of the copper dissolved in Nitric Acid, left a heavy white residuum, which, digested in concentrated Sulp. Acid, left another residuum, which last digested in an excess of Muriatic Acid, boiled and diluted with water, gave a solution which shewed the presence of Cobalt; as under:—

Caustic Potash—Brown.
Ditto Ammonia—Blue rose.
Carb. of Soda—Pale rose.
Bi-carb. Ammonia—No re-action till the Acid was neutralized, when pale rose.
Hyd. Sulp. of Ammonia—Pale dirty yellow.
Ferro-chyaz. of Potast. Emerald green, (next day dark blue deposit.)
Tincture of Galls—Brown.

∴ *Cobalt* with a little Titanium.

Summary.

This Mineral is an alloy of Copper, Titanium, Mercury, Lead, Cobalt and Iron, in different proportions.*

Remark.

The different pieces vary in their composition.

S. MORNAY.

No. 13, *Chowringhee Road,* 28*th November*, 1843.

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* There is, in the Philosophical Magazine for June 1843, an account of a Fahlerz containing Mercury from Hungary, but we have as yet found no traces of Sulphur or Antimony with our Mineral. The specimen which I examined, which was one of the first sent up by Capt. Williams was nearly pure native copper, with a coating of red oxide and the blue and green carbonates.—H. P.

Memoranda of Earthquakes and other remarkable occurrences in Upper Assam, from January 1839 *to September* 1843. *By Capt.* HANNAY, *B. N. I.*

Year.	Month.	Day of Month.	Occurrences.	Remarks.
1839	January	14,	Earthquake 9 P. M.	Felt at Suddeeah, direction apparently from S. W. to N. E. preceded some days by rain and heavy snow in the mountains; air very cold.
... ..	Feb.	....	....	This month commenced hot, with dreadful hail storms, thunder and lightning.
......	June	3,	Earthquake 8 P. M.	At Suddeeah, apparently from South to North, strong N. E. wind. Burrumpooter high, wet and disagreeable weather.—N. B. From March up to this date, the season unusually rainy. Small-pox very prevalent, lost several men and a native officer from this disease.
......	Sept.	....	Cholera.	Cholera broke out, and continued with more or less severity at Suddeeah until the end of November; about 30 men in the corps died —this disease followed a Detachment which proceeded on service into the Mishmee Hills on the 18th October, and spread amongst the Hill tribes.—N. B. Although I now forget the month, I think there were four shocks of Earthquakes felt at Suddeeah in 1839.
1840	March	4.	Total Sun Eclipse and Earthquake.	When the sun was obscured, the air was unusually cold and disagreeable to the feelings, even to nausea. About an hour after the Eclipse passed off, *i. e.* about 1 P. M. a smart shock of an Earthquake, and about 10 minutes afterwards another; both shocks appeared to have come from south—these I felt outside, the sky cloudless, but the atmosphere hazy.
				1840. Passed without any thing else remarkable; it was a healthy and seasonable year.
1841	Feb.	9,	Earthquake.	Felt an Earthquake at Gowhatty on either the 9th or 11th, forgot which. This Earthquake was different to those above-mentioned; it was accompanied by a low rumbling noise; was sharp and stunning, as if a blow had been struck under the jaw; the others alluded to, appeared, on the contrary to have more of a trembling or rocking motion.
......	June	....	Gales.	Strong gales on the Burrumpooter, both this month and July, from the N. E.
			Meteor.	N. B.—In February 1841 at night, a splendid Meteor was seen at Seebsagur, and in other stations in Upper Assam. It passed from East to West of the heavens, and burst with a loud report, the first like the firing of several large guns, and ending exactly like musquetry file firing.—Individuals on the Frontier who had not seen the Meteor, imagined some of the out-posts had been attacked.

Year.	Month.	Day of Month.	Occurrences.	Remarks.
1842	January	4,	Earthquake 7½ P. M.	A smart shock felt at Seebsagur; the weather gloomy, cold and threatening rain; cannot speak as to duration; shock similar in motion to those already noticed.
1842	June	Gales.	....	From 3d to 6th, heavy gale of wind from South-west.
......	October	29,	Earthquake about 8 P. M.	A smart shock of an Earthquake; duration apparently from S. W. to N. E. trembling motion.
1843	Feb.	....	... .	Air unusually wet; a disagreeable month.
During these months, Cholera very severe at Gowhattee, Nowgong and Durrung; several cases at Seebsagur in June, but none fatal.	March	7,	Comet.	Seen at Sakenah on the evening of the 7th of this month. Head with a common compass W. 21° South, and of Tail West 47° South—rain continued most of this month.
	April	4,	Meteor.	From East to West seen at Seebsagur, burst with two loud reports.
	April	6,	Earthquake 8 P. M.	After a very hot day and close sultry evening, a severe shock of an Earthquake at Dibrooghur, lasted several minutes. The motion however was only trembling, affected those houses which had posts built up by walls; duration appeared to be from West or South-west.
	April	7,	Earthquake.	Slight shock felt at Dibrooghur at midnight. N. B. Both these Earthquakes felt at Seebsagur, Jeypoor and all over Upper Assam.
	May	24,	....	From this date to 27th May, gales of wind at Seebsagur from S. W. Some of the squalls very severe, sky in the day time clear, but stiff looking, with some white fleecy clouds; gale blowing hard on 26th along the line of the Naga mountains 15 miles distant, and on the Burrumpooter, which rose very high.
1843	June	15,	Earthquake 11 P. M.	At 11 A. M. smart shock of an Earthquake; motion, vertical.
......	June	17,	Earthquake 8 P. M.	A very smart shock; at first slight and followed by a severer one; motion undulating, and from the position of a clock which was stopped, must have come from S. W. or West; lasted altogether about a minute. The weather rainy, with occasional light squalls from S. W. These shocks felt at Dibroo, Jeypoor and Sakenah, that of this date at a few minutes past 8, reported by the Officer to have thrown down a portion of the bank of the Burrumpooter.
	August	23,	Meteor.	A meteor of no great magnitude passed to the North, very vivid lightnings in the S. W. several flashes appeared as if rising from the ground like the bursting of a shell.
	Sept.	3,	Earthquake 2½ P. M.	After as hot and sultry a day, (the 2d) as I ever felt, the clouds gathered to S. W. indicating rain, but passed off without any; night very close and sultry; awoke by a smart shock of an Earthquake; cannot speak as to duration.

Year.	Month.	Day of Month.	Occurrences.	Remarks.
1843	Sept.	3,	Earthquake 7½ P. M.	After a very hot day, clouds gathered at S. E. very close and sultry; squall came on a little before sunset; vivid lightning all round the heavens; previous to squall, making an extraordinary noise in the heavens over head like the falling of heavy rain on distant jungle, or like the rushing of wind through a funnel, with this noise you heard an occasional growl like distant thunder. When the rain fell, this noise, which had continued for sometime ceased—thunder very high in the heavens, but the lightning one blaze all round. Whilst at dinner, smart shock from the South.

Memorandum of various Phænomena in 1843. *By the Rev.* N. Brown, *Missionary Assam.*

January 14.—Great gale in England.

February 8.—Earthquake at Antigua.

February 18.—Earthquake at Leipsic.

February 27.—The comet passed its Perihelion.

March 3.—Comet seen at Sea 10° S Lat. 25° W Long.

March 6.—Comet seen at Calcutta.

March 10.—Earthquake in England at 1 A. M.

April 1.—Earthquake at Bellary at 5 A. M.

April 4.—Meteor at Sibsagur,

April 6.—Earthquake at Sibsagur about 8 o'clock in the evening.

April 7.—Earthquake at Sibsagur at 1 A. M.

June 3.—Earthquake at Titalyah.

June 15.—Earthquake at Sibsagur at 11 A. M.

June 16.—Earthquake at Sibsagur at 8 P. M.

June 17.—Earthquake at Ceylon.

August 23.—Evening, a meteor fell near Sibsagur.

September 3.—Earthquake at Sibsagur at ½ past 2 A. M., another at ½ past 7 P. M.

Proceedings of the Asiatic Society.

(Wednesday Evening, the 4th October, 1843.*)*

The regular Monthly Meeting was held on Wednesday evening the 4th October.

The Honourable the President in the chair.

The following new Members were balloted for and proposed:—

Dr. A. Sprenger, B. M. S. was duly elected; and ——

W. Ganthony, Esq. was proposed by the Secretary, and seconded by Mr. Piddington.

The following list of Books, presented and purchased, was read.

Books received for the Meeting of the Asiatic Society on the 4*th October,* 1843.

The Calcutta Christian Observer, October 1843, new series, vol. iv, No. 46. Presented by the Editor.

The Calcutta Literary Gleaner, Calcutta, August and September 1843, vol. ii, Nos. 6 and 7. Presented by the Editor.

Supplement to the Oriental Christian Spectator, 2nd series, Bombay, August 1843, vol. iv, No. 8. Presented by the Editor.

The Monthly Journal of the Agricultural and Horticultural Society of India, Calcutta, 1842-43, vol. ii, Nos. 1 to 7.

Hart's Report on the Trade and Resources of Kurrachee, Calcutta, 1843. Presented by Government.

Survey of the Route from Kurrachee to Sehwan, Calcutta, 1843. Ditto.

Report on the Kulleeree Canal, 1840. Ditto.

Collection of Papers regarding the course of the Indus, and especially of its Eastern Mouth and the Branches falling into the Runn of Cutch, Calcutta, 1843. Ditto.

The Annals and Magazine of Natural History, London, June 1843, vol. xi, No. 72.

Yarrel''s History of British Birds, London, June 1843, vol. i, part 37.

Wilson's Translation of the Megha Duta, or Cloud Messenger, 2nd Edition, London, 1843. From the Author, H. H. Wilson, Esq. &c. &c.

Stevenson's Translation of the Sanhita of the Sama Veda, London, 1842.

Selections from the Mahabharata, edited by F. Johnson, London, 1842.

Sanhita of the Sama Veda, from MSS. prepared for the Press by the Rev. J. Stevenson, London, 1843, (Sanscrit.)

Read the following letter from the Secretary of the Royal Asiatic Society of London:—

To the Secretary of the Asiatic Society of Bengal, Calcutta.

DEAR SIR,—I have had the pleasure to receive, through Messrs. W. H. Allen and Co. your letter of the 11th May, enclosing a Bill of Exchange for £21, the amount of two years' Subscription of your Society to the Oriental Translation Fund. As Messrs. Allen and Co. have paid the Subscriptions for 1842 and 1843, the amount of your Bill shall be duly credited to your Society for the years 1844 and 1845.

With thanks for your obliging attention to my request for a remittance,

I have the honor to remain, Dear Sir,
Your's truly,
JAMES REYNOLDS,
Secretary.

London, 14, *Grafton Street, Bond Street,*
11*th July*, 1843.

Read the following letter from the Society's Booksellers and Agents, Messrs. Allen and Co.:—

To H. TORRENS, ESQ. *Secretary to the Asiatic Society.*

SIR,—We have received your letter of the 11th May, informing us of your having resumed the duties of Secretary to the Asiatic Society, upon which we congratulate you. By the enclosed letter you will observe, that we have paid £21 to the Rev. James Reynolds, on account of the Subscription of the Society to the Oriental Translation Fund for the years 1842 and 1843. We shall be obliged by your attention to our letters of 29th April, and 17th and 30th June last, addressed to Mr. Piddington, as Secretary to the Society.

We are, Sir,
Your most obedient Servants,
WM. H. ALLEN & Co.

London, July 31, 1843.

Read the following letter from Mr. John Murray, son and successor of Mr. John Murray, of Albemarle Street, London:—

SIR,—Among the numerous accounts of Books which, in succeeding to the business of my late father, I have caused to be made out, is that of the Royal Asiatic Society,* and I now forward you a copy of it from 1834, when it was last settled. The balance due to the Society shall be paid as you direct, as soon as you furnish me with the authority for so doing, and enable me to obtain a receipt.

I have to call your attention to the very slow and partial sale of the Transactions for some years past, and to suggest that, if you were to place the work in the hands of some publisher more intimately connected with India, the interests of the Society might be more surely advanced. I have to request you to take this into consideration, and to authorize me to deliver over the stock now in my warehouse to such Agent as you may appoint. As I anticipate removing my warehouse shortly, it would be very convenient to me to resign this charge, which I feel to have been an honor.—From some error in our enumeration, we paid the Society for certain copies of Vol. VII, which we now find are still in our hands.

I remain, Sir,
Your obedient Servant,
J. MURRAY.

Albemarle Street, August 4.

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* So in MSS. the common mistake of confounding the *Asiatic Society of Bengal*, with the Royal Asiatic Society of London.

Dr. ***The Asiatic Researches in Account with*** **JOHN MURRAY,** **CR.**

1843, June 30.	£.	s.	d.
To Advertising to this date, ...	8	8	0
9 Copies of Vo. VIII, accounted for last Setltlement as sold, but still on hand at 32, less the Commission, ...	12	19	3
28 Vol. XVIII. pt. I to Messrs. Parbury and Co. 19-6 ...	19	10	0
15 ditto to Asiatic Society, Calcutta, 19-6	14	12	6
Balance carried forward, ...	16	11	3
	72	1	0

1834.								
April 1	5	Vol.	I.	on hand at this date, remains the same.				
	2	,,	II.	... ... ditto ...				
	105	,,	VI.	... ... ditto ...				
	201	,,	VII.	... ... ditto ...				
+	106	,,	VIII.	... ... ditto ...				
	202	,,	IX.	... ... 2 sold	32	3	4	
	153	,,	X.	... ... 1 ditto	32	-1	12	
	217	,,	XI.	... ... 1 ditto	32	-1	12	
	59	,,	XII.	... ... 1 ditto	32	-1	12	
	30	,,	XIII.	... ... 2 ditto	32	3	4	
	29	,,	XIV.	... ... 2 ditto	32	-3	4	
	13	,,	XVI.	... ... 7 ditto	32	-11	4	
	15	,,	XVII.	... ... 9 ditto	32	-14	8	
+	9	,,	VIII.	Additional on hand.				
Physical Class.	40	,,	XVIII.	pt. I. Received 19-6 }		39		
ditto.	10	,,	XVIII.	pt. II. ditto 2 sold 10-6		1	1	
						80	1	0
				Commission, ...		8	0	0
						72	1	0

	£.	s.	d.
Vol. 12			
1843, June 30.—To Balance carried forward,...	4	9	6
	4	9	6

	£.	s.	d.
1843. June 30. Balance carried forward, ...	16	11	3
8vo. By 293 on hand, last settlement Dec. 1829.			
284 on hand, June 30, 1843.			
9 sold, ... ,, 11, 4-19			
Commission, 9 6			
	4	9	6

Copies on hand
June 30, 1843.
5 vol. I.
2 ,, II.
105 ,, VI.
201 ,, VII.
115 ,, VIII.
200 ,, IX.
152 ,, X.
216 ,, XI.
58 ,, XII.
28 ,, XIII.
27 ,, XIV.
6 ,, XVI.
9 ,, XVII.
8 ,, XVIII.
Part 2.
vol. XI.
8vo.

1843.		£.	s.	d.
June 30.	Balance carried forward, ...	4	9	6
	Ditto on the 18 vols. as per Acct. above,	16	11	3
	Due to the Asiatic Society,... ...	21	0	9

The following letters relative to this matter are here inserted for the sake of connection :—

To J. MURRAY, ESQ. *Albemarle Street, London.*

SIR,—I have the pleasure on behalf of the Asiatic Society of Bengal, to thank you for your communication of the 4th August last, forwarding your Account Current with the Society closed to the 30th June last, exhibiting a balance of £ 21 : 0 : 9 due to the Society, which sum you are hereby requested to pay to Messrs. W. H. Allen and Co. of Leaden hall Street, on their receipt.

Messrs. Allen and Co. will also receive from you the stock of Books you have on hand on behalf of the Society. I am, &c.

Calcutta, 13*th December,* 1843. H. TORRNES.

Messrs. W. ALLEN *and* Co., *London.*

DEAR SIRS,—I had the pleasure to address you on the 5th September last, to which begging reference, I now take the opportunity to enclose a letter to the address of Mr. J. Murray of Albemarle Street, requesting him to transfer to you the stock of Books he has on hand belonging to the Asiatic Society, which up to the 30th June, 1843, was as per Memorandum furnished by Mr. Murray, and is annexed to this communication for your information and guidance. Mr. Murray has been also requested to pay to you, on your receipt, the sum of £ 21 : 0: 9, being the balance due to the Society from him. This sum you will place to the credit of the Society in Account Current with yourselves.

The stock of Books which will be received by you, you will sell as opportunities offer, placing proceeds to credit of the Asiatic Society, and furnish A. C. in course for information.

I have &c.

13th December, 1843. H. TORRENS.

Read the following letter from Messrs. Allen and Co.

To the Secretary to the Asiatic Society, Calcutta.

The 13th June, 1843.

SIR,—We beg to advise you of our having forwarded a case to the above address, by the ship Essex, containing a marble bust of the late James Prinsep, Esq. We enclose a Bill of Lading.

The Bust was sent to us by Professor Wilson, with instructions to forward it to the Society by an early opportunity.

We beg to annex for your information, an account of the shipping and other expences incurred by us, which sum we have placed to the debit of the Society.

We have the honor to be, Sir,
Your most obedient Servants,

London, June 17, 1843. WM. H. ALLEN & Co.

Asiatic Society, Calcutta, London, to Messrs. WM. H. ALLEN *and* Co. per "*Essex.*"

June 12,
1843. Asiatic
Society, Calcutta,
H. Piddington,
Esq. Secre-
tary.

Case containing Marble Bust of J. Prinsep, value £105 forwarded by direction of Professor H. H. Wilson. ...	£105	0	0
Charges.			
Entry, Wharfarge, Shipping expences and Bills of Lading, ...	0	14	0
Freight £1 : 7 : 0; Insurance on £110. at 40 per cent £2 : 4 . 0 and policy 10s.	4	1	0
	£109	15	0

Read letter from Messrs. Collett and Co. acknowledging receipt of the 49 (not 50 as supposed) copies of the Scinde Vocabulary, sent to them for sale.

Read the following letter from the Secretary to Government of India in the Foreign Department:—

No. 193.

Office Memorandum.

The Secretary to the Government of India in the Foreign Department has the honor of forwarding to the Secretary of the Asiatic Society, for deposit in the Society's Library, one copy of each of the printed papers noted in the margin.

Collection of Papers regarding the course of the Indus, &c.
Survey of the Route from Kurrachee to Sehwan.
Report on the Trade and Resources of Kurrachee.
Report on the Kulleeree Canal.

Fort William, Foreign Department, J. THOMASON,
The 30th September, 1843. *Secretary to the Govt. of India.*

The Secretary stated, that it had been brought to his notice by Dr. Roer, the Librarian, that the present Library rules were by no means sufficient for the careful and exact custody of the Books, and that some amendments and additions were imperatively required. Ordered, that the Committee be requested to revise the Library Regulations.

Read the following papers, detailing the progress which had been made since the Meeting of September, in carrying into effect the Society's resolution to address Government on the subject of the new Volcanic Island and Copper Ore deposit near Cheduba.

Memorandum by the Geological and Mineralogical Curator, as requested by the Society.

At the September Meeting of the Society was read the following letter of Captain D. Williams, Assistant Commissioner, Arracan :—

No. 1824.

My dear Sir,—The Soogree, or head revenue officer on the Island of "Regaing," or "Flat Island," has just made a report, of which the enclosed is a translation, that on the 26th, 27th, 28th and 29th of last month, a Volcano broke out in the sea, a little distance South of "False Island," and a new Island was formed.

On reference to a chart of Arracan, you will see that "False Island" is East of "Flat Island," and the latter is South of "Round Island," whence I obtained the Copper Ore I lately sent to the Asiatic Society; the groupe is situated on the S. E. shore of the Island of Chedooba. I consider the subject of sufficient interest to report on to the Society, especially as regards its vicinity to the Island where the Copper Ore was found. Yours, &c.

Ramree, August 9, 1843. (Signed) D. Williams.

P. S. I have sent for specimens of the new formation.

2. A notice of the Copper Ore alluded to will be found in our Proceedings for the month of April, but I may briefly state here, by way of connecting the facts for consideration, that in March Captain Williams sent us up some very pure specimens of rolled native (virgin) Copper, and a ring manufactured from them by a native artist, which he stated had been found on Flat Island.

I wrote for more of it, as also for information as to the site, and specimens of the matrix, &c. before reporting on the subject to Government, and Captain Williams in reply sent me a quantity of gravel and shells from the sea shore, without a trace of the ore amongst it,* which the native discoverers had brought to him as a sample of the bed or place where the ore was found. I thought this very suspicious, and that it was probable that the natives having found out the value of the Copper ore, were now concealing the spot from Captain Williams, and wrote again to him, urging him if possible, to send a person in some degree qualified to give us a plain common-sense account of the place where this rich ore was obtained, upon which I could found a recommendation to Government, in my report, to have the place properly examined, as there could be no doubt of the value of the ore; but that the quantity and expense of obtaining it were the next and most important considerations. I also mentioned it to Captain Brown and Mr. Howe, the

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* Some more Copper was also sent *separately*, and these specimens were of a different kind of Copper ore from those first sent.— H. P.

Naval Officers at Kyook Phyoo, and to the Commissioner, Captain Bogle. Captain Williams' last reply was, that he feared that for the present they had no one who would be likely to furnish a good account, but mentions Captain Siddons, the local Engineer Officer, to whom I intended to write, but illness for the last five weeks has prevented the preparing of my report to Government, and further correspondence on the subject.

Capt. Williams' letter was read at the meeting, but omitted in the Proceedings.—

My dear Sir,—An apology is due from me to you for having neglected to reply to your letter of May last, (I believe,) about the Copper Mine on Round Island, of which I am reminded by your letter, just received, of the 28th ultimo.

I should then have informed you, or I now beg to do, that it is necessary for a scientific person being sent to examine the spot. There is no such individual in this province that I am aware of, unless Lieut. Siddons of the Engineers, just arrived, may be; this must be done too in the fine season between November and April.

I lately sent up two gold Coins found on Chedooba to the Asiatic Society; since then I have had brought in two lumps of iron six inches long by 1½ inch broad in the centre tapering to the ends, found on the same spot with the coins; the natives here tell me, they are weapons used by the *Eastern pirates*, which they hurl like a javelin at boats in attack, and that some such pirate boat must have been wrecked on Chedooba where the iron and coins have been found. I do not give sufficient credence to so improbable a story as to induce me to send up one of the *Javelins*, but will keep them for the Asiatic Society's orders. Yours very truly,

Ramree, July 20, 1843. D. Williams.

3. It was proposed and sanctioned at the Meeting, that the Society should respectfully represent to Government the importance of dispatching some fully qualified person to the spot to examine into, and report upon it for general information.

4. The principal grounds upon which we may do so are, as they occur to me, the following:—

First.—The great, and indeed intense interest which geological phenomena of this kind invariably excite in Europe, as being connected with, and most strongly illustrating many researches and theories relative to the past and future changes of our globe.

Secondly.—Their interest in a maritime point of view, as connected with the appearance and disappearance of shoals, &c. in seas extensively navigated.

Thirdly.—The occurrence of the phenomenon so immediately in our own vicinity, and at a spot with which by means of the H. C. S. *Amherst*, we have a regular communication; so that, to use a homely phrase, "we have no excuse" for neglecting to investigate it.

Fourthly.—The great interest attaching to it as occurring so near to the spot of the recent eruption of the mud volcano of Ramree, and so soon after the great earthquake at Pulo Nias, on the coast of Sumatra, and its forming the Northern extremity of the great volcanic band laid down by Von Buch as extending only to Barren Island.

Fifthly.—Its undoubted connection with all the singular phenomena of the upheavements going on upon the Island of Cheduba, as by Captain Halstead's report, and the rich field which the adjoining coasts and islands probably afford for valuable geological data, as to the former changes which have taken place both there and further to the Northward and inland to the Eastward.

Sixthly.—The foregoing considerations are geological ones. The presence of the rich copper ore makes it perhaps a matter of *financial* importance to Government to trace out if possible whence this is derived. It may be a mere ejection from the volcanos, as is supposed to occur in Iceland, or it may be that some of the islands or shoals are masses of copper ore, or that rich deposits of copper exist on the mainland or on the banks of the Aeng river; and I should mention in reference to this, that, as shewn to the Society at a recent meeting in the case of silver ores, rich ores of copper (the grey, black, and tile copper ores) might easily be thought common stones by those unaccustomed to recognise them.

There are, in short, all the *possibilities* from zero upwards, in such matters; and it is rare indeed that the opportunity occurs of tracing out on the same spot at one and the same time two questions, the one of abstract and the other of practical science.

Lastly.—I need not remark, that in researches of this kind, mere zeal without knowledge is a very insufficient qualification, and that it would be most unfortunate were the Society not to represent to Government in the strongest terms, that the most fully qualified person that can be found should be selected, and this plainly on financial as well as on scientific grounds.

If Members of the Committee of Papers will kindly add such farther suggestions as may occur to them, we shall be able thereupon to draft a letter to Government, setting forth the Society's views on this question, and respectfully soliciting its adoption of them.

H. Piddington,

13th September, 1843. *Curator Mineralogical and Geological Departments.*

Memorandum by the Secretary.

I have to submit to the Hon'ble the President and the Committee of Papers, a note prepared by the Curator of the Museum of Economic Geology, upon the proposed recommendation to Government, that a properly qualified person be sent to report upon the peculiar geological phenomena, which have been recently observed in the neighbourhood of Chedooba Island, as also upon a discovery of copper ore in the immediate vicinity of the volcanic influence.

The opinion of the Society has been recorded as to the high expediency of such a measure, and it now only remains to be decided, whether Government should be addressed as being requested to despatch a proper person, or whether the Society should not rather propose to select and despatch such a person, superintending, controlling, and directing his operations, the general charge being defrayed at the public cost.

I should be prepared in the event of the latter proposition being entertained, to lay before the Hon'ble the President, the names of qualified persons, from whom an employé might be selected, and have even had a proposition made me by a gentleman of scientific attainments to be allowed to accompany the person deputed as for his individual satisfaction, giving the advantage of the result of his observations. This would give us a double set of notes.

I need not say that we have no officer of the Society available for this scientific mission. The duties of the Museum imperatively require the constant presence and steady exertion of our officers, for after years of labor we are only just now beginning to establish order, and the good work must not be relaxed in.

I have the honor to request orders on the above points. H. Torrens,

Vice President and Secy. As. Socy.

H. Torrens, Esq. *Secretary, Asiatic Society of India.*

Sir,—Having heard that the Society contemplate sending a person to investigate certain Geognostical phenomena in the Indian seas, I beg leave to offer my humble services to the Society for that purpose.

In support of my pretensions I hand you with this, copies of three documents, the originals of which I have by me, ready to produce when called for.

Mr. Marshman's letter I shew you, merely to prove that I have executed work of a scientific and laborious character in this country, without any assistance, to the satisfaction of a man well capable of judging it.

The report of Mr. Robt. Stephenson, the Engineer of the London and Birmingham Railway, upon the plans and estimates for a Railway in Brazil, shows that he was satisfied with my work in this peculiar line,—and the document upon which I lay most stress, is the certificate of the Council of Mines of Saxony; on the face of which you will see, that I have acquired some knowledge of all the Arts and Sciences which bear upon Mining, including Geology, Mineralogy, Chemistry, Metallurgy, Assaying, Surveying, and Mining Engineering: all of which may probably, more or less, be brought into action, on this occasion.

I beg to assure you, that if the Society should entrust me with this interesting commission, no exertion shall be spared by me to further the objects of my employers.

Your most obedient Servant,

Calcutta, 25th September, 1843. S. Mornay.

Mr. Mornay's certificate above alluded to is as follows :—

We, the Council of Mines of the Kingdom of Saxony,

Hereby testify, that Mr. Stephen Mornay from London, was matriculated on the Mining College of this place, by Royal License, dated 9th October 1829, and that he attended the following courses of lectures with great industry and very good success ; viz. Mining ; Geology ; Mineralogy ; Petrefactology ; Natural Philosophy ; General, Technical, Metallurgical, and Analytical Chemistry ; Metallurgy ; Transcendant Mathematics ; Construction of Mining Machinery ; Architecture and Drawing. And that he proved himself zealous in the attainment of practical knowledge in Geology and Mining. And that his conduct has always been moral and gentlemanly.

To certify these facts, we have, at his request, drawn up this certificate, sealed with the seal of the Council of Mines. Signed by us.

L.S.

Freyberg, 6th October, 1832. *Royal Saxon*	(Signed)	Freyheer v. Herder.
Council of Mines.	(Ditto)	H. v. Mandelsloh.
Certificate for S. Mornay, No. 1966.	(Ditto)	R. E. G. Segnitz.

H. T. Torrens, Esq. *Secretary, Asiatic Society of India.*

Sir,—In reference to the offer of services contained in my letter to you of the 25th instant, and in regard to the payment of those services, I beg to state that I readily agree to the terms and conditions proposed by you at the Society's Rooms yesterday; viz.

1st. That I receive Co's. Rs. 400 (four hundred) per mensem, for whole months, and Co's. Rs. 150 (one hundred and fifty) per week for broken periods.

2nd. That I receive Co's. Rs. 3 (three) per diem, for my travelling expenses, whenever I am not supplied by the Honourable Company, with the means of conveyance, and

3rd. That all contingent expenses be defrayed by the Honorable Company.

I beg to add, that my time is in no way engaged, and that consequently I do not limit the term of my services to any period, but shall be glad to be employed on any other service I may be deemed fit for by the Society.

Your most obedient servant,

Calcutta, 28th September, 1843. S. Mornay.

The Secretary and Committee of Papers were requested to address Government, proposing that a scientific person be deputed at the public cost to investigate the Geological and Mineralogical Phœnomena of this quarter.

Read the following letter from Capt. D. Williams, 1st Assistant to the Commissioner Arracan:—

My dear Sir,—I have now the pleasure to send you the two lumps of iron that were found with the gold coins on Chedooba, and which, the natives say, are the weapons used by the pirates from the Eastward in their attack on boats. Lieutenant Phayre, the Senior Assistant of Sandoway, proceeds to Calcutta on leave on the "*Amherst,*" and will probably take charge of these lumps of iron, and if I see him on his way, I will request him to converse with the natives on the subject. I shall feel extremely obliged for any information that may be gained respecting the gold coins; they are not coins of this country, either under the Mug or Birman dynasties, as Lieutenant Phayre can prove. Yours sincerely,

Ramree, August 23, 1843. D. Williams.

The lumps of iron alluded to were exhibited. They are much corroded, but their form seems to have been, when perfect, a rough double square pyramid, of about two or three inches on each side joined at the base, which is now about two inches only. They presented externally the usual carbonised appearance and softness of iron which has been much exposed to water, but were found to be internally sound and metallic.

Read the following letter from Conductor Dawe, relative to the remains of the Dadoopoor Museum, which have been kindly offered to the Society by Capt. Baker, B. E.:—

To H. PIDDINGTON, ESQ. *Sub-Secretary, Asiatic Society, Calcutta.*

SIR,—I beg to acknowledge the receipt of your note respecting the collection which has been offered to the Society by Captain Baker, and in reply, I beg to inform you, that I find in the Museum three or four fair specimens of Mastodon's heads; a few large masses of the heads of above with the upper jaws, and the teeth in good preservation, several of lower jaws of above, the enamel of the teeth in good condition; a few fragments of heads and bones of Hippopotamus and Rhinoceros, and numerous bones of smaller animals in a fractured state, but which can be easily joined with our cement. I can also select a variety of the teeth of deer, horse, bullock and the like. But what I now particularly write for, is, to get your instructions as to the quantity you would wish me to send, as I find the cost of each six dozen chest full that has been sent down to Calcutta through the merchants at Meerut, has been on an average 21 rupees each, including land carriage from this place to Gurmuckteesur Ghat, (eight stages,) and boat hire thence to Calcutta.

As soon as I receive your reply, I shall have much pleasure in selecting what you may require.

I rer am, Sir,
Your obedient servant,
Dadoopoor, Sept. 6, 1843. WM. DAWE, *Condr. Canals West of Jumna.*

It was stated that Mr. Dawe had been requested to forward the whole of these valuable relics.

Read a letter from Capt. Thos. Hutton, B. N. I. accompanying specimens of the Flata Limbata, with that of its wax, and a paper on this Insect and the White Wax of China.

The paper was transferred to the Editors of the Journal for publication. Read the following letter from Capt. Hannay, B. N. I.: from Seebsagur, Assam.

MY DEAR SIR,—Perhaps the enclosed Memo. from this part of the world may be interesting. I wish I could speak more correctly as to Earthquakes, for we have I am pretty sure a number of shocks yearly, commencing about January after our first rain which falls about New Year. After very sultry and close weather the air becomes very cold, and we could thus almost say, that atmospheric influence had something to say to our Earthquakes, else we are in the vicinity of some Earthquaking power. Most of our shocks do not appear to be felt lower down the valley, but I have understood that at Tezpoor, shocks are very frequent. No volcanoes in the neighbourhood, but the line of the Naga Hills (nearer ranges) abound in iron and coal and numerous Petroleum springs, and in the Singpho country springs of white thin mud. You may depend upon my notes of all the Earthquakes put down in the Memo. The shocks this year have been nine in number, and severe compared to those of other years, particularly on 17th June last. It is difficult, however, to ascertain the duration of the shocks. In 1834, an Earthquake threw down partly the old palace of Rungpoor, and a part of the earth opened near Jorehath, from which issued red sand and water. The Cholera visited the valley in 1834, 1839, and 1843. Your sincerely,

Seebsagur, 5th September, 1843. W. HANNAY.

This peculiarly interesting document was transferred to the Journal for publication, and the Sub-Secretary stated, that he had had a copy prepared for forwarding to Lieut. Baird Smith, who has so zealously taken up this branch of research.

Read the following letter from G. Buist, Esq. in charge of the Hon'ble Company's Observatory at Bombay:—

H. Torrens, Esq. *Secretary to the Asiatic Society.*

Dear Sir,—I duly received, through the Bombay Government, a copy of your application to be supplied with copy of the Registers of the Bombay Magnetic and Meteorological Observatory at present temporarily under my charge.

I should have complied immediately with your request, and forwarded a monthly number of our observations so far as they extend, that is, from 1st September 1843, without delay, but that as we were on the eve of completing the year, I have thought it better to defer for a few weeks, when the volume will be sent to you.

I have taken the liberty of explaining this to you for the information of the Society, lest you should suppose that the delay had arisen from any neglect or inattention.

I have forwarded by the Ship *Samuel Boddington*, to the address of Mr. Piddington, a copy of a chart for the use of the Asiatic Society of the readings of nine Barometers observed simultaneously for 24 hours, projected on curves—the memoir explanatory of this is now nearly ready, and will be sent by post.

I shall at all times have the greatest gratification of forwarding for the use of your Society, any documents connected with the Observatory they may desire to possess.

I have the honor to be, &c.

Bombay, 6th September, 1843. Geo. Buist.

Read a letter from Capt. Thos. Hutton, B. N. I. offering for sale to the Society, a large collection of above 1600 specimens of Natural History from Affghanisthan and the Hills. The offer was declined, the Society already possessing a large proportion of the specimens.

Read extract from a letter from Capt Boileau, Magnetic Observatory, desiring to know whether the Society would be willing to take up the publication of his Hygrometric Tables.

It was resolved, that the Society do so.

Read the following extract of a letter from Lieutenant Colonel Reid, R. E. Governor of Bermuda, and author of the well known work on the Law of Storms, addressed to the Sub-Secretary, affording a gratifying proof of the interest taken in that branch of research at home, and of the advantage which the early publication of the labours of scientific men through the Society's Journal affords them.

My dear Sir,—I have received all your six Memoirs, and I believe all your letters, and I should have answered your last one sooner, but for the importance I attached to the Memoir on the Storms of the China Seas. I have read it with great attention, and the more I considered it, the more I saw you had bestowed great pains upon it. As I went on reading, I drew a diagram on the margin for each storm, such as a seaman would have to draw, had he no data but his own observations in the midst of a storm. If you could get wood-cuts made at Calcutta, such diagrams would, I think, improve your papers.

There can be no doubt, as you shew, that some of the Storms as they pass over the China Sea, have sometimes a course to the Southward of West. At first I thought the Storm of each of the ships called *Thetis* must be but one storm: but after attentive study, I am more inclined to agree with you and with your paper, which throughout bears the impression of attentive consideration. I hope you will be able to go on, and be supported in your endeavours to develop this great subject as regards the Indian Seas. I do not doubt that you will be assisted by the Governor of Hong-Kong and the British Government Agents in China, and shall consider whether any recommendation from me can help to procure such aid for you, not from the intrinsic worth of any recommendation of mine, but of the value of the subject, and the importance of it in saving life and property.

Here the Admiral on this station, Sir Charles Adam, is giving us great assistance by requiring all the squadron under his command to improve the mode of keeping the log books, and helping in what he can to track the gales. One Storm we have followed from the West Indies nearly across the American continent, at least to the mountain ridge beyond Victoria in Mexico.

I do not recollect that I sent you a copy of the enclosed printed note.—" On sailing on curved Courses when meeting with revolving winds," which has been printed three times over. I hope soon to receive some other tract from you. Believe me,

Yours, &c.

Government House, Bermuda, 23*d June,* 1843. (Signed) W. REID.

Read the following Report from the Curator Museum Economic Geology, for the months of August and September.

During the month of August, illness having prevented my preparing a report, the present one will comprise both months.

Museum Economic Geology.

Our first contribution here is a truly valuable one from Mr. Homfray, to whom the Journal is indebted for a valuable paper on the coal mines of the Damoodah District, in 26 specimens from the Amanath and others of the Palamow Coal Fields, comprising specimens of the strata (in one instance to the granite) and of various trap dykes of the greatest geological and mining interest. Mr. Homfray's letter is as follows:—

H. PIDDINGTON, ESQ.

MY DEAR SIR,—I have now the pleasure to forward for the acceptance of the Asiatic Society for their Museum of Economic Geology, a set of specimens of the strata in the Amanath Coal Field of Palamow District, as also some others from the Palamow Coal Field, together as per list annexed.

I have also sent some of the principal specimens of the sandstone rock which I have hitherto met in sinking my deep pit at Salmah, now, August 1843, down as low as 275 feet, having passed through seven veins of inferior and thin Coal and one of Iron stone, and am still going downward, having persevered for many years in sinking this pit, and at an enormous outlay of money to myself alone.

I send also two pieces of the Basaltic Dykes taken from the place where the two greatest Dykes of the Coal Field of Damoodah actually cross each other; thus one is from the Bharah Dyke to distinguish it from that of Salmah, and this Bharah is evidently the most *recent,* as it runs through that of Salmah, and the other piece is from the Salmah Dyke at the same locality. The Ironstone from beneath the Beharcynauth Hill is the same sort as what is now smelted near to Gautcole.

From the Barracar I send a piece of the great fault (Greenstone) which throws up and cuts off abruptly the vein of Coal, and also a curious sample of the Coal found and cut from the vein close to the fault.

I am, Dear Sir,
Yours faithfully,
J. HOMFRAY.

Golahdangah, Howrah, 18*th August,* 1843.

1. Sandstone, the upper one of the Amanath Coal Field.
2. Shale.
3. Sandstone the second.
4. Ditto (hard) from the middle of Coal vein.
5. Ditto with pebbles over main Coal.
6. Shale below main Coal.
7. Sandstone below ditto.
8. Ironstone.
9. Main Coal.
10. Conglomerate Sandstone below the Ironstone.
11. Black Shale below ditto.
12. Syenitic Quartz. below ditto.
13. Granite below ditto.
14. Found in the pass between Shapore and Choperco.
15. Black Shale found to the Westward of the Coyle and towards the Kunkur Run.
16. Limestone (Lias?) from Rotasghur.
17. Black Shale from near Bidgeghir by Kuleas Copas village.
18. Ironstone from Potua Agar in the Palamow Coal Field.
19. Thin Coal from several veins in the river near Rotas (Palamow.)
20. Five samples of Sandstone from the Salmah pit, now sinking.
21. Clay slate from ditto.
22. Basalt from Bharah Dyke, } at the intersection.
23. Ditto from Salmah ditto, }
24. Ironstone from Behareynaut.
25. Coal from the fault in the Barracar Colliery at the fault.
26. Greenstone from the above fault.

Our next contribution is from Captain R. Ouseley, Assistant to the Agent of the Governor General, S. W. Frontier, who forwards with the following letter, specimens of Agalmatolite.

To the Secretary of the Asiatic Society of Calcutta.

DEAR SIR,—I have the pleasure to forward by this day's Dawk Banghy, a small package to your address, containing three specimens which appear to me to answer the description given in "*Jameson's Manual of Mineralogy*" of Agalmatolite, or Figure stone.

The two smallest pieces I polished myself by rubbing them on a broad file. I have not yet visited the spot where it is to be found, but am told that it can be obtained in large quantities, and from all accounts, slates of considerable size might be gained by skilful workmen, adapted for chimney pieces, tops of teapoys, &c. &c.

As my duty will probably take me in the direction where the stone is found, I shall endeavor in the cold season, to proceed to the spot and examine it myself. I shall feel much obliged if you would inform me whether this may be considered a discovery of any value, and if you let me know on what points, and regarding what minerals, &c. you would wish to have information, I shall at all times have much pleasure in forwarding any I may obtain.

I am, Dear Sir,
Yours very faithfully,
R. OUSELEY.

In reply to which I wrote as follows :—

My dear Sir,—Your specimens duly arrived, and I am glad to say are as you supposed Agamatolite; the light greenish-white kind is probably the most valuable, but we should have some good slabs and blocks sent down to ascertain their value *in China*, where some of the kinds, and of the varieties of Jade (Axe-stone often found near these rocks,) are highly prized. You may have seen in the papers that they are shipping the New Zealand kind, which is like transparent green marble, to China. Carriage is the great obstacle I fear from your quarter, but however, you may be able to find out a cheap road. Kindly give us early information as to localities, &c. and as the rock has an evident tendency to seam and split in rhomboidal fragments, any approaching to crystals would be a great prize if you can find them.

Your best specimen of lead and antimony ore contains a *mere trace* of silver, but in my report which has gone in to Government, I have urged the importance of sending a practical man to the spot. The report is now printing, and I will send you a slip as soon as I get one.

Yours very faithfully,

22nd August, 1843. (Signed) H. Piddington.

From the Superintending Engineer, S. E. Provinces, Major Fitzgerald, B. E. we have received a box containing the various specimens of Tin alluded to in Capt. Tremenheere's report of his visit to the Pakchan river, which with the former one, will thus be available in the Museum for the inspection of those who may interest themselves in these matters.

Geological and Mineralogical Department.

Observing in a paper published by Brigadier Twemlow in the Journal, No. 135, p. 229, mention made of "indurated clay with fossils" near Ellichpoor, I wrote to him, requesting the favour of specimens. He has sent us one which is of much interest, a hornstone prophyry with imbedded casts of shells from thence, and he promises others as soon as he can obtain them.

My dear Sir,—I have the pleasure to acknowledge the receipt of your polite letter of the 12th instant; it will give me much pleasure if I can be of any use to the Society, and in attention to your request, I forward immediately a specimen of the fossil shells alluded to in note E of my communication of date 30th August, 1841, to the address of the Secretary, of the Agricultural and Horticultural Society. I shall be glad if you would at your leisure inform me what the matrix is, and the name of the larger shell if it can be made out. I found the specimen* in the bed of a nullah at the south base of the range of hills about six miles N. N. E. of this cantonment; I will search for the site whence it was washed. I am, Dear Sir,

Yours truly,

Ellichpoor, July 29, 1843. George Twemlow.

As the consideration of my note on the advantage and utility of deputing a qualified person to examine the new Volcanic Island in the neigbourhood of Ramree, and the site from whence the copper ore was obtained, has formed a special matter of discussion, I do not further allude to it here, as it will be found in the Proceedings. H. Piddington.

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* With others having the appearance of wood outside, as in the small specimen sent herewith. This is a fragment of fossil bone.—H. P.

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JOURNAL

OF THE

ASIATIC SOCIETY.

Mr. Blyth's monthly Report for December Meeting, 1842, *with Addenda subsequently appended.*[*]

SIR,—The following donations have been received since our last Meeting :—

1. From the Barrackpore establishment.

A fine old male of the Wandaroo Monkey (*Macacus Silenus*). The skin has been mounted, and the skeleton also set up.

A recent example of the *Rhizomys badius*, Hodgson, received from Arracan. This animal entirely accords with Mr. Hodgson's description in *Calc. Jour. Nat. Hist.* No. V, 60: and I have also had both its skin and skeleton set up.

Also a recent example of what I am assured is the Sikim breed of long-haired domestic Goat, being (if I remember rightly) the same as that erroneously figured by Mons. F. Cuvier as the Kashmir or Shawl Goat, and nearly similar to the mixed race produced between the latter and the Angora Goat. In our present specimen, the hair is excessively copious, as fine as that of the human head, and straight; being comparatively short on the fore-quarters, where it does not exceed five inches in length; on the back it averages nine inches; and on the sides and rump it exceeds twelve inches, the quantity on these parts being truly enormous, and hanging in dense flakes more or less matted, which contain large felted masses of the cast inner *poshm,* that it would not be possible to separate as now entangled (though, by attention to combing these animals at the season of shedding the *poshm,* I presume this might be removed, and the value of the fine long hair thus enhanced, while the *poshm* would also be available for œconomic purposes). The true Shawl Goat, as is now well known, is not a long-haired race, but has a rigid tubular coat resembling that of the wild *Œgagrus,* or of the true Stags, &c., only of twice the ordinary length, beneath which is the very abundant supply of *poshm,* or fine silky wool, of which the Kashmir stuffs are manufactured; while the Angora breed is quite devoid of the *poshm,* having only silky hairs of one quality, which hang in elegant ringlets to a remarkable length.

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[*] The lateness of the appearance of this and subsequent monthly Reports due up to the present time, is owing to the circumstance of my having been too much occupied at the time the arrears of the Journal were brought up, to pass them severally under review prior to their being laid before the public, for the purpose of incorporating what additional information I had received bearing on the subjects treated of, and which it was desirable should be brought forward upon the same occasion.—E. B.

Also a recent Himalayan Chicore *(Perdix chukar).*

2. From Mr. DeCruz, of the Botanic Garden, an unusually fine specimen of *Paradoxurus typus,* which has been mounted.

3. From Dr. McClelland, a recent example of *Ierax melanoleucos,* Nobis, *ante,* p. 179 *(bis),* from Assam.

4. From Mr. F. Harris, a specimen of an Albatross pertaining to a species new to the museum, being probably the *Diomedea melanophris,* Tem. *Col.* 456, thus briefly described in Griffith's Work, VIII, 572, which is the only account I can find of it in the library of the Society. "Beak, wings, tail, and streak through the eye, black; the rest dirty-white." The specimen before me is under three feet in length, closed wing twenty inches, tail nine inches, bill to forehead (in a straight line) four inches and a half, and middle toe and claw nine inches. Head, neck, and under-parts, with the rump, white, but little sullied, and merely a faint trace of a dark streak through the eye: mantle, wings, and tail, black, tinged with ashy; and some unmoulted brown coverts on the wings: bill pale yellowish, the extremities of both mandibles dusky, except the extreme tips, which are whitish; and feet apparently have been cinereous.*

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* Another specimen of this Albatross has lately been presented to the Society by Mr. R. Macdonald Stephenson: it merely differs in having the beak suffused throughout with dusky, and the hind-neck with smoky-grey; being probably a female.

Daption Capensis.

5. From Mr. J. Stalkart, a large living specimen of *Varanus binotatus.*

6. From M. Claude Queiros, a small specimen of a Flying Fish (*Dactylopterus orientalis*), caught off the Cape.

7. From W. H. Benson, Esq., Moradabad, three species of Shells transmitted by letter in a quill; viz.

Triarta montana, Benson; four specimens, from the Bhountal Lake, Kemaon.

Planorbis calathus, Benson; six specimens, Moradabad.

Cyclostoma strangulatum, Hutton; four specimens, Landour.

8. From R. Ince Esq., Superintendent of Salt Chokees, Zillah Backergunge, three bottles containing—

Specimens of a *Gryllus,* very destructive to young vegetables, and which abounds in the Society's compound.

One of an *Acanthodis,* which I have also obtained in the Calcutta Botanic Garden: and

Two specimens of the small Moonah Worm, which Mr. Ince found considerable difficulty in procuring. This Worm is of a very different species from that described in *J. A. S.* XI, 601; having no mandibles that should enable it to perforate wood. It measures from three to four inches in length, and is furnished with a suctorial mouth, the circular lip of which is studded externally with small cones of a dark colour, and forms on its upper portion a pair of tubercles having each four similar cones, between and above which tubercles are four other cones of the same kind: this lip is surmounted by a mask having three divisions, the central of which is furnished with a very distinct pair of eyes situate near the first ring of the body, and laterally to each eye are placed four small branchial laminæ. The rings of the body are very numerous, and are each furnished with a lateral wide lamina, bearing three packets of bristles appearing like fins; and on the upper side of each lamina is a dark spot. Colour, as appearing in spirits, light brown.

The Collector sent by the Society to Darjeeling has returned, with examples of the following species, of which those new to the museum are marked with an asterisk.

Mammalia.

Ursus labiatus: a skeleton.

**Talpa cryptura,* Nobis: a skin, and a specimen in spirits.

**Sorex aterrimus,* Nobis: an adult male, and a young one, both in spirits. (This and the preceding species will be described in a monograph of Indian *Talpidæ).*

Sciurus bicolor, Sparrman.

Sciuropterus Turnbullii (?), Gray, *P. Z. S.* 1837, p. 67; *Mag. Nat. Hist. n. s.,* I, 584. From recollection of the British Museum specimen on which this name was founded, I strongly incline to the opinion that I have assigned this correctly, but have elsewhere given a description of some Darjeeling specimens, which are inferior in dimensions to those ascribed to *Sc. Turnbullii* by Mr. Gray.†

AVES.

Falco tinnunculus.

Accipiter nisosimilis, Tickell, *J. A. S.* II, 571.

Athene Brodiei; Noctua Brodiei, Burton, *P. Z. S.* 1835, p. 152; *N. tubiger,* Hodgson, *As. Res.* XIX, 175.

Upupa epops.

Bucco grandis; three specimens.

——— *Franklinii,* Nobis, *J. A. S.* XI, 167.

Picus (Gecinus) Nipalensis, Hardwicke and Gray; doubtfully cited *P. mentalis,* apud Jerdon.

P. (Dendrocopus) Himalayanus, Jardine and Selby: two males.

Cuculus canorus: young of both sexes.

——— *micropterus,* Gould: female.

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† From the same locality, the Society has lately been presented, by Mrs. Oakes, with a fine specimen of *Sciuropterus caniceps,* Gray, *Ann. and Mag. Nat. Hist.* 1842, p. 262; one of *Sciurus lokriah,* Hodgson, *J. A. S.* V, 232; and one of *Sc. McClellandii,* Horsfield, *P. Z. S.* 1839, p. 151, to which species must be referred *Sc. Pembertonii,* Nobis, *J. A. S.* XI, 887. This little Himalayan Squirrel is represented on the Neilgherries by *Sc. Delesserti,* Is. Geoff., and in the Malay countries by *Sc. insignis,* Horsfield, and I believe others. By E. B. Ryan Esq., the Society has been presented with a Darjeeling specimen (at least the skin was purchased there) of *Felis macrocelis,* which species has since been sent from Nepâl by Mr. Hodgson. Vide *J. A. S.* XI, 275. These two specimens vary much in ground-tint, inclining respectively to grey and to fulvous; but their markings are very similar.

* *Cuculus poliocephalus,* Latham, v. *Himalayanus,* Vigors and Gould: female.

Corvus macrorhynchos, Vieillot, v. *culminatus,* Sykes: sent as the *Raven* of Darjeeling.

Crypsirina Sinensis.

* ——— *altirostris,* Nobis, n. s., adult and young. Described in the sequel.

Keropia striata; Garrulus striatus, Vigors.

Garrulax chrysopterus; Ianthocincla chrysoptera, Gould.

——— *albogularis; I. albogularis,* Gould: *Cinclosoma albigula,* Hodgson.

Ixops Nipalensis, Hodgson: *Cinclosoma Nipalense,* and subsequently *Alcopus* (olim *Sibia*) *Nipalensis,* of the same naturalist: six specimens.

Heterornis (olim *Cutia*) *Nipalensis,* Hodgson: six specimens.

* *Pteruthius rufiventer,* Nobis, *J. A. S.* XI, 183, two males.

——— *erythropterus; Lanius erythropterus,* Vigors and Gould.

Leiothrix cyanoptera; vide XI, 184.

——— *strigula.*

——— *castaniceps.*

Parus monticolus, adult and young.

Certhia Himalayana.

Sitta Nipalensis, Hodgson.

* *Temnoris* (olim *Suthora*) *Nipalensis,* Hodgson.

* *Prosorinia* (olim *Cochoa*) *purpurea,* Hodgson.

* *Xiphoramphus superciliaris,* Nobis, *J. A. S.* XI, 176.

* *Cinclidium frontale,* Nobis, *J. A. S.* XI, 181.

Calliope (?) cruralis, Nobis, *n. s.* Described in the sequel.

Œnicura maculata.

* *Zoothera monticola,* Vigors and Gould; three adults, and a young one.

Turdus (Merula) pœciloptera.

T. (Geocichla) citrina.

T. (Petrocincla) affinis, Nobis, *ante,* p. 177 (*bis*).

T. (Petrocincla) erythrogastra, Vigors and Gould. *N. B.* The sexes of this species differ remarkably in their first or nestling plumage, the young males having the wings and tail blue, as in the adult males, while in the females of all ages these are brown; besides which, the mottled clothing plumage of the young males has the same fulvous ground-colour as the under-parts of the adult females, this being whitish in the young females, contrasting greatly with the corresponding garb of the other sex.

**Chaitaris* (Hodgson) *grandis*, Nobis, *J. A. S.* XI, 189; two males and a female.

Ch. sundara, Hodgson.

Saxicola caprata ; female.

**Rhipidura hypoxantha*, Nobis, *n. s.* Described in the Sequel. (Genus *Chelidorhynx, Hodgson.)*

Anthus agilis (?).

Alcurus (Hodgson) *striatus ; Tricophorus striatus*, Nobis, XI, 184.

Dicrurus macrocircus, Vieillot.

Coccothraustes melanoxanthus, Hodgson.

**Corythus (?) Sepahi*, Hodgson, *As. Res.* XIX, 151; a male and a female. The minute subdivisions among the *Fringillidæ* are almost endless, and many grade and pass insensibly into each other: but this gorgeous species is certainly out of place in the form typified by *C. enucleator*, whilst the other species described by Mr. Hodgson on the same occasion by the term *C. subhemalayanus* [which the Society has also since received from Darjeeling] is a true *Corythus* in its plumage, but a *Pyrrhula* in its beak. The present bird is more allied to some of the *Erythospizæ* of Bonaparte, but is distinguished from them by its larger size and more tumid bill. It is occasionally procured by the Calcutta bird-dealers.

Erythrospiza (?) rosea.

Corypha (?) baghaira.

Treron sphenurus.

Columba (Macropygia) tusalia. Described in the sequel.

REPTILIA.

Three species of Snakes, one of them allied to the European *Natrix torquata :* and

Hyla obtusa, Nobis. A Tree Frog distinguished from the common *H. maculata* of Bengal by its nearly uniform dark colour and more obtuse muzzle; the back is also considerably broader, and the loins are less contracted. The skin of the entire under-parts is perfectly smooth, instead of being minutely tuberculated as in *H. maculata.* The limbs also are proportionately much larger and stronger. Colour of the specimen preserved in spirits dark livid brown, with a broad lateral black band commencing at the nostril, continued beyond the eye, and becoming less distinct after passing the fore-leg; sides of the abdomen, and the thigh, a little mottled or speckled, and the fore-limbs and legs obscurely banded with livid black: beneath pale and spotless. Length from muzzle to vent two inches and one-eighth, and breadth behind the eyes seven-eighths of an inch, of the loins half an inch; anterior limb to end of longest toe an inch and a half, and hind limb ditto four inches and a half: eyes large and prominent.

PISCES.

Pimelodus nangra, Buch. Hamilton.
Pimelodus —— ? Young.
Cyprinus cotus, Buch. Ham.
Gobio isurus, McClelland.
Silurus —— ? Young.
Solea isostoma, McClelland, M.S.

MOLLUSCA.

Three species of Shells, undetermined.

CRUSTACEA.

One large species of *Oniscus,* which also occurs on the Neilgherries.

ARACHNIDA.

Two or three Spiders, one of large size, which I have somewhere seen figured, and which is common here during the cool season, and also inhabits the forests of Malabar.

INSECTA.

A considerable collection, almost entirely consisting of *Lepidoptera, Coleoptera,* and a moderate number of *Hemiptera.* Among the first, is the celebrated Purple Emperor Butterfly of Europe *(Apatura iris),* and various other European species, as *Doritis Apollo, Rhodocera* v. *Gonepteryx rhamni,* the cosmopolite *Cynthia cardui* (which I have also procured near Calcutta, and have specimens from Afghanistan and from Swan River (!), *Papilio Machaon* (very small, as are all the Himalayan examples which I have seen), and some of the more rare Himalayan species, several of which I have made out from the excellent work of M. Boisduval in the *Suites à Buffon.*

The new species of birds from Darjeeling are as follow :—

Crypsirina (Vieillot) *altirostris,* Nobis: genus *Phrenotrix,* Horsfield; *Dendrocitta,* Gould. Nearly allied to the Assamese *D. frontalis* (McClelland and Horsfield), with which it would appear to form a particular section of the group, characterized by having the bill shorter, but much more compressed and deeper, than in the others;—being in fact absolutely that of *Glaucopis,* so far as I can remember the latter. Length fifteen inches, of which the tail measures nine inches and a quarter, the penultimate feather being two inches shorter, and the outermost six inches and a half shorter; of wing five inches and one-eighth; of bill to forehead (through the feathers) an inch, and five-eighths of an inch deep; tarse an inch: claws remarkably long, that of the hind-toe five-eighths of an inch, measured in a straight line. The head (including the vertex, but not the occiput), ear-coverts, throat, and fore-neck (to the breast), are deep black; wings and tail also black, the coverts of the former, excepting those of the primaries, pure ash-grey; the occiput and remainder of the neck, together with the breast and belly, whitish-grey; the back, scapularies, upper and lower tail-coverts, vent and flanks, bright ferruginous (as in *Cr. vagabunda*); tibial feathers mingled grey and rufous: bill and feet black. Young similar in markings, but all the colours, excepting the black and ferruginous, much duller; the plumage of flimsy texture.

This is the sixth species of its genus now ascertained to inhabit India or its immediate confines, besides the *Phrenotrix temia,* Horsfield, which Dr. Helfer asserts is met with in the Tenasserim provinces. The others are as follow :—

1. *Cr. vagabunda; Coracias vagabunda,* Latham: figured in Gould's *Century.* Everywhere abundant, I believe, throughout India, and in the Tenasserim provinces.

2. *Cr. Sinensis; Corvus Sinensis,* Gmelin: figured in Gould's *Century.* A mountain species, common on the Himalaya, and Mr. Jerdon thinks that he has observed it in open jungle in the Segoor

Pass of the Neilgherries, and he has seen specimens killed in the eastern range of ghâts of Southern India.

3. *Cr. leucogastra; D. leucogastra*, Gould, *P. Z. S.* 1833, p. 57, and figured in *Trans. Zool. Soc.* I, pl. XII. Mr. Jerdon has only seen this elegant species in the jungles of Malabar and the Wynaad, and it would appear to be peculiar to the Indian peninsula.

4. *Cr. rufigastra; D. rufigastra*, Gould, *P. Z. S.* 1837, p. 80. "Nearly allied to, but differs from *Cr. leucogastra* in its shorter tail, and in the less extent of the black colouring on the tips of the two central tail-feathers, in the chestnut-brown colouring of the under surface, and in the thickened and more robust bill. India."

5. *Cr. frontalis; D. frontalis*, McClelland and Horsfield, *P. Z. S.* 1839, p. 163. Assam.

6. *Cr. altirostris*, Nobis, *ante*. Darjeeling.

Other species of this genus exist, or appear to exist, in — 7. *Cr. rufa; Corvus rufus*, Latham, *Supp.; la Pie Rousse de la Chine*, Sonnerat; and figured by Levaillant as *la Pie Rousse, Ois. de l'Afrique*, pl. 59: which was observed in China by Sonnerat, and is said to be also found in India.—8. *Cr. rufiventris; Pica rufiventris*, Vieillot: Shaw's *Zoology*, XIV, 64. Apparently very closely allied to, if not identical with, *Cr. vagabunda;* and said to inhabit Eastern Asia.—9, *Cr. leucoptera, Glaucopis leucopterus*, Tem., *pl. col.* 265, (see also Griffith's Work, VII, 184, or Shaw's *Zoology*, XIV, 73:) from the Malayan Archipelago.*—10. *Cr. temnura; Gl. temnura*, Tem., *ibid.* 337: briefly described in Griffith's work as — "Plumage dusky-black, shaded with dark grey; tail curiously scalloped, India?"—And 11. *Cr. varians; Corvus varians*, Latham, *Supp.; Temia*, Levaillant; *Phrenotrix temia*, Horsfield, *Lin. Trans.* XIII, pt. I, 162, and figured and further described in his 'Zoological Researches in Java.' Inhabits the Malay countries, and (apud Helfer) the British Tenasserim provinces.

Calliope (? Gould) *cruralis*, Nobis. Under this generic designation, I avail myself of Mr. Jerdon's suggestion to merge the genus *Larvivora*, Hodgson, *J. A. S.* VI, 102, at least as instanced by the

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* This I have just received, and find that it is properly referred to a separate genus—*Temnuris*, Lesson. Mr. Hodgson's generic name *Temnoris* approaches this too nearly.

Phœnicura superciliaris, Jerdon *(Supplement to Catalogue),* which quite agrees with Mr. Hodgson's description of *L. cyana**: and the present species is only distinguishable from that bird, on its upper parts, by a very slight and inconspicuous character; whilst the lower, being concolorous with the former, but paling a little on the belly, affords a very striking contrast with those of *C. cyana,* wherein they are wholly bright ferruginous with the exception of the lower tail-coverts: the tarsi, also, of our present species are considerably longer, as in my *Cinclidium frontale,* and of a dark colour: its wings are shorter and rounder than in the other species of *Calliope;* and tail rather shorter and weak. Length five inches and a quarter, of wing two inches and five-eighths, and tail an inch and three-quarters; bill to forehead (through the feathers) nearly five-eighths of an inch, and typically formed; tarse an inch and a quarter. Colour a full deep cyaneous, or dark greyish-blue, paling on the belly, and relieved by a white superciliary streak, confined to the bases of the feathers and yet shewing conspicuously: bill black; and legs (in the dry specimen) brownish-dusky. This bird is reported to be a pleasing songster.

The genus *Calliope* would accordingly consist of the following five species, all natives of India or the Himalaya, being at most winter visitants in the low country.

1. *C. Lathami,* Gould, *Icones Avium; Motacilla Calliope,* Pallas; *Turdus C.,* Latham; *Accentor (!) C.,* Temminck. A regular winter visitant in Bengal, and found likewise in Central India: being met with (according to the season) over the greater part of Asia, even in Kamtschatka. It is closely allied to restricted *Turdus.*

2. *C. pectoralis,* Gould, *Icones Avium.* Has a more graduated tail than in the others, tipped with white, which also extends over the basal half of the tail-feathers, except the middle pair, and on the exterior web of the outermost pair: general colour dark ashy, the middle of the belly white, breast and sides of the throat black, the rest of the throat bright crimson, and a white superciliary streak. Inhabits the Himalaya.

3. *C. cyana; Larvivora cyana,* Hodgson, *J. A. S.* VI, 102; *Phœ-*

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* The Society has since received a specimen from Mr. Hodgson, shewing the above identification to be correct.

nicura superciliaris, Jerdon, *Supplement.* Nepâl: also the Neilgherries.

4. *C. brunnea; L. brunnea,* Hodgson, *ibid (Non vidi).* Nepâl.*

5. *C. (?) cruralis,* Nobis, *ante.* Darjeeling.†

Rhipidura hypoxantha, Nobis. Length four inches and a half, by six inches in alar expanse; of wing two inches and one-eighth, and middle tail-feathers two inches and a quarter; bill to forehead (through the feathers) under three-eighths of an inch, being proportionally much shorter than in its congeners; and tarse half an inch. Colour of the upper-parts dusky-ash, tinged with green on the head; lores black; a bright yellow eye-streak, continued across the forehead; and the under-parts wholly bright yellow: tail conspicuously white-shafted, with also white interior edges to the feathers for their terminal half: bill dusky above, the under mandible pale; and legs pale brownish, darker on the toes. Darjeeling. Specimen preserved in spirits.

The following are the Asiatic species of this genus at present known to me:—

1. *Rh. fuscoventris,* Franklin, *P. Z. S.* 1831, p. 117; *Broad-tailed Flycatcher* of Latham; *Muscicapa (Muscylva) albogularis,* Lesson, *Zoologie du Voyage de M. Bélanger,* p. 264. Common in the vicinity of Calcutta at all seasons, but rather of local distribution in peninsular India.‡ The male has a short, but musical, tinkling song.

2. *Rh. albofrontata,* Franklin, *ibid.* Common in peninsular India, extending northward to the vicinity of Saharunpore, where the preceding species is also met with; but it does not appear to occur in Lower Bengal.

3. *Rh. pectoralis,* Jerdon, *M. S.*§ Length about seven inches, of which the tail measures nearly four inches; closed wing three inches. Upper-parts brownish-dusky; the head black, passing into the former:

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* Mr. Hodgson says "sexes alike," or I should have suspected the female of *C. Lathami* to be intended.

† A Nepalese example of this species has just been received from Mr. Hodgson, who refers it to his genus *Larvivora.*

‡ The *Rh. fuscoventris* mentioned in Mr. Jerdon's catalogue as having been seen, but not procured, by him on the Neilgherries, proved to be *Rh. pectoralis;* but the other is included in Col. Sykes's list of the birds of Deccan, *P. Z. S.* 1832, p. 85.

§ Briefly described in the first No. of Mr. Jerdon's 'Illustrations of Indian Ornithology', which has just appeared.

superciliary streak, throat, and belly, white; the under tail-coverts tinged with rufous: sides of the throat and breast, black, the middle of the latter marked with oval white spots, smaller in front: wings dusky, the coverts slightly tipped with albescent; and tail the same, all but its middle feathers, passing gradually into whitish towards their extremity. Bill black; and legs dusky. The tail is much graduated, having its outermost feathers two inches shorter than the middle ones. Inhabits the Neilgherries.

4. ***Rh. Javanica; Muscicapa Javanica***, Sparrman; ***Platyrhynchus perspicillatus***, Vieillot. Malay countries generally.

5. ***Rh. nigritorquis***, Vigors, *P. Z. S.* 1831, p. 97. Philippine Islands: perhaps identical with last.*

6. ***Rh. hypoxantha***, Nobis, *ante*. Darjeeling.†

Columba (Macropygia, Swainson,) [*tusalia*, Hodgson.] Male fifteen inches and upwards, of which the tail measures seven inches and a half, its outermost feathers four inches and a half shorter, and the rest evenly graduating; wing seven inches and five-eighths, the third primary rather the longest, and the second a little exceeding the fourth; bill to feathers scarcely five-eighths of an inch, and tarse seven-eighths. Colour of the upper-parts dusky-black, each feather narrowly but conspicuously margined, and more or less barred, with deep rufous; the forehead and cheeks whitish-grey, tinged with lilach: throat whitish: crown gradually more ashy; and occiput, nape, and hind-neck, successively more broadly margined with brilliantly glossed extremities to the feathers, of a changeable hue from green to purplish-red, upon a dark ashy ground; sides of the breast the same, its medial portion more narrowly thus edged: belly slightly tinged with pale buff, deeper on the lower tail-coverts: greater wing-feathers wholly dusky; and tail the same, its four medial feathers somewhat obscurely crossed with numerous rufous bars, the outermost pair greyish-white for the basal two-thirds of their exterior web, and the rest of the tail—except the middle feathers—ashy at base, with a broad subterminal dusky band, and greyish tips successively paler to the outermost: bill dusky-black (in the dry specimen), and feet have evidently been coral-red. Female rather smaller, and similar to the male on its upper-parts, except that the barring on the tail is more developed, and the forehead and crown are also crossed with narrow rufescent lines, together with the entire under-parts. Length about fourteen inches, of which the tail measures seven inches and a quarter, and wings also seven inches and a quarter. Concealing the head and neck, this species might almost be mistaken for a *Cuculus;* more especially the female. From Darjeeling, where extremely common.*

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* Add ***Rh. collaris***, Lesson, ***Rev. Zool. par la Soc. Cuv.*** 1839, p. 104. "*Corpore nigro; collo anticè niveo; superciliis albis; caudæ pennis albo marginatis aut terminatis.* Hab. Timor." This description does not well distinguish it from ***Rh. fuscoventris***.

† Mr. Hodgson has lately sent a specimen also of this bird, which he separates from *Rhipidura* by the name *Chelidorynx*, an arrangement which I shall now adopt.

[While the preceding notices were passing through the press, another interesting collection of Darjeeling specimens has been submitted to my inspection, and I have been kindly permitted to make a selection from them. The following appear to be undescribed :—

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* Since the above was written, the Society has received a description of this Dove from Mr. Hodgson (dated May 1, 1843), who applies to it the generic or subgeneric term *Coccyzurus*, remarking further on its *Cuculine* appearance; but he mentions having "discovered it some years ago, and written a character of it on the back of the drawing (No. 663), that went to England long ago *to be locked up there!*" His description now sent is as follows :—

" *Vinaginæ*. [To this location of it I demur altogether.—E. B.] Genus *Coccyzura* (olim *Tusalia*), Hodgson. Bill long and slender, as in *Columba:* wings short; the third quill longest. Tail as in the *Coccyzinæ*, or very long, broad, and graduated throughout, with broad ends to the feathers. Legs and feet suited for perching only, and slender: tarse equal to the thumb: toes long and slender, flat-soled, the inner and hind bordered, and unequal all: nails large, simple. Rump spinous.

"Type. *C. tusalia*, Hodgson. Head and neck as in the common wild Pigeon, with golden-green gloss on latter. Above, brown-black, cross-barred with chestnut (in young?); below, rufescent-luteous with frequent dusky cross-bars. Alars blackish. Central caudals like back; laterals plumbeous with broad dark bar as in the wild Pigeon. Legs, orbits, lores, and cere, red: bill black. Length sixteen inches and a half: bill to gape one inch: tail eight inches and a half: wing seven inches and a half: tarse to sole fifteen-sixteenths of an inch: central toe and nail one inch and seven-sixteenths; hind fifteen-sixteenths of an inch. Solitary, and a deep forester: not found in the plains.

" *Remark.*—This form, like Swainson's *Ptilinopus* and our *Dendrotreron* [*Col. Hodgsonii*, Vigors, *P. Z. S.* 1832, p. 16], serves to connect the *Columbinæ* or Insessorial or typical Pigeons with the *Vinaginæ* (or dentirostral?) or *tree* Pigeons. It has much the aspect of a Cuckoo, and the tail exactly of the *Coccyzinæ*, the bill of *Columba* proper, and the feet nearly of *Ptilinopus*. It represents *Geopelia* of the *Ptylophyrinæ* or rasorial Pigeons (ground *Columbines*), and is closely allied to, if not a subgenus of, *Macropygia*."

Sitta formosa, Nobis. This very beautiful bird appears to present no sufficient distinction upon which it could be separated from the ordinary Nuthatches, though the style of colouring of its upper-parts is peculiar, and its size also is comparatively large: the relative length of its wing-primaries may, however, be different; but these were in process of renewal in the specimen before me. Length about seven inches and a half, of wing four inches, and tail two inches and a quarter; bill to forehead (through the frontal plumes) seven-eighths of an inch; tarse three-quarters of an inch; and hind-toe and claw an inch. Colour of the upper-parts black, beautifully variegated with different shades of ultramarine-blue; the scapularies and rump verdigris; and the wing-coverts and tertiaries elegantly margined with white at their tips: under-parts bright rusty-fulvous, somewhat paler on the breast, and inclining to albescent on the throat: the frontal feathers are tipped with white, and around the eye also is whitish, continued backward as an ill-defined supercilium tinged with fulvous posterior to the eye: crown and back deep black, each feather tipped with brilliant ultramarine, forming large and pointed triangular spots; on the back these incline more to verdigris, and are dilute and whitish over the shoulder: wing-coverts black, with strongly contrasting terminal white margins as described, and more or less laterally edged, as are also the large alars, with bright lavender-blue, which likewise appears within the white margin of the tertiaries, and tips their inner-webs; middle tail-feathers lavender-blue, with black mesial line, the rest black edged externally with blue, and tipped with duller blue, the outermost having a large white spot at the extremity of its inner web, and the next a smaller terminal spot of the same. "Irides dark: bill blackish, the lower mandible pale underneath: and legs greenish horny, with yellow soles."

Kitta venatorius (var.?). Entirely resembles the ordinary *K. venatorius* in form and proportions, but the colour beautiful deep sea-green, the head a more yellowish-green, and a distinct tinge of yellow on the sides of the forehead, above the broad black streak through the eyes; wings sanguineous, brightest on the secondaries and outer margin of the tertiaries, the latter having the subterminal black bands and verdigris tips strongly defined. "Iris hazel; legs, bill, and eyelids, vermillion." The rump of this most beautiful specimen inclines a little to the usual verdigris-blue of the species, and there is also a slight admixture of the same here and there upon the back and especially on the scapularies. The specimen is a male, and I conceive it to exhibit merely the thoroughly mature dress of its species. Of several examples before me in ordinary attire, both adult and young, not any present a decided admixture of green on the plumage, and one only (a young bird from Tenasserim) has the wings rusty-sanguineous, others exhibiting more or less trace of the same, chiefly on the interior of the feathers, the rest being dingy greyish. I also observe that in the golden-winged species of the genus *Garrulax (*v. *Crateropus),* as *G. chrysopterus, affinis,* &c., the analogous yellow colour is similarly convertible to dull greyish, which occasionally margins the feathers, concealing the brighter tint within.

Muscicapula, Nobis. *n. g.* The members of this group are nearly allied to *Dimorpha* (olim *Siphya,*) Hodgson, *Ind. Rev.* 1839, p. 651, from which they are chiefly distinguished by their small size and feeble legs and toes, the latter approaching them nearer to the Fly-catchers. The brilliant colouring of the first allies it to restricted *Chaitaris* (olim *Niltava*), Hodgson, and also to the group exemplified by *Phœnicura rubeculoides* of Vigors and Gould, which now that I have three species appertaining to it, I venture to separate from *Chaitaris,* to which Mr. Hodgson formerly referred the *rubeculoides.* The following four are referrible to the present division:—

1. *M. sapphira; Muscicapa sapphira,* Tickell, *M. S.* Length five inches, of wing two inches and a half, and tail an inch and seven-eighths; bill to gape nine-sixteenths of an inch, and tarse five-eighths of an inch. Colour of the upper-parts rich dark purplish-blue, inclining to ultramarine on the rump and upper tail-coverts; fore-head and crown vivid smalt-blue; the lores black; fore-neck and breast rich purple, with a broad median line of deep and bright ferruginous; flanks greyish, the belly and fore-part of the wings underneath, with the axillaries, white; alars and tail black edged with blue externally. Bill and feet black. Unlike the three following species, the *M. sapphira* has no white at the base of its tail externally. Procured at Darjeeling.

2. *M. superciliaris; Muscicapa superciliaris,* Jerdon, *Madr. Jl.* XI, 16: *Dimorpha albogularis,* Nobis, *J. A. S.* XI, 190. Himalaya, and has been obtained also in Central and Southern India.

3. *M. melanoleuca,* Nobis, Hodgson. Length four inches and a half, of wing two inches and a quarter to two and three-eighths, and tail an inch and seven-eighths; bill to gape nine-sixteenths of an inch, and tarse half an inch. Colour wholly black and white: the upper-parts black, with a broad white eye-streak, and broad longitudinal mark of the same upon the wings, commencing on the coverts of the secondaries and continued along the margin of the tertiaries, which in some are further edged with white round their tips; under-parts also white, and basal half or more of the outer tail-feathers. Bill and feet black. Nepal, Darjeeling.

4. *M. rubecula,* Nobis; *Dimorpha superciliaris,* Nobis, *J. A. S.* XI, 190, which specific name must now be transferred to the second species. Nepal, Darjeeling.

Of true *Dimorpha,* Hodgson, I know of only two species; viz.

1. *D. strophiata,* Hodgson, upon which the group was founded: and

2. *D. auricularis; Chaïtaris auricularis,* Hodgson, *M. S:* which has the cœrulean spot on the sides of the neck common to the species of restricted *Chaitaris,* but the rest of its plumage is plain dull olive, rufescent on the wings and tail, and slightly on the rump, the under-parts paler and inclining to whitish on the belly. Length about five inches, of wing two inches and a half, and tail two inches; bill to gape nine-sixteenths of an inch, and tarse five-eighths of an inch. Inhabits Nepal and Assam.

Very closely allied to these is the *Muscicapa leucura,* Gm., the adult male of which is *Saxicola rubeculoides* of Sykes: but Mr. Hodgson makes a separate group of it, though it scarcely differs except in having the first primary less developed and the second more so.

Of true *Chaitaris,* I know of three species; viz.

1. *Ch. grandis,* Nobis, *J. A. S.* XI, 189. Common at Darjeeling.

2. *Ch. sundara,* Hodgson, *Ind. Rev.* 1837, p. 651. Also common at Darjeeling and in Nepal: and

3. *Ch. McGregorii; Phœnicura McGregorii,* Burton, *P. Z. S.* 1835, p. 152; *Ch. fuligiventer,* Hodgson. Himalaya. The following species I separate by the appellation

Cyornis, Nobis: having the bill less compressed, the tarsi shorter and together with the toes more feeble, and altogether partaking more of the Flycatcher form; they also have not the brilliant cœrulean spot on the sides of the neck conspicuous in the foregoing group.

1. *C. rubeculoides; Phœnicura rubeculoides,* Vigors, *P. Z. S.* 1831, p. 35; *Chaitaris brevipes,* Hodgson. Himalaya, and visits the neighbourhood of Calcutta during the cold season, where I have obtained several specimens; but I have never seen it from the Indian peninsula.

2. *C. banyumas; Muscicapa banyumas,* Horsfield; *M. cantatrix,* Temminck; *M. aurea?* Lev.,[*] which name would hold precedence; *M. rubecula,* Swainson, *Nat. Libr.,* the female. Southern India and Malay countries.

3. *C. Tickelliæ,* Nobis; *M. hyacintha,* Tem., apud Tickell, *J. A. S.* II. 574. Of a more greyish blue than the preceding species on the upper-parts, brightening on the forehead, shoulders of the wings, and upper tail-coverts; throat and breast light ferruginous, the belly albescent, and under tail-coverts pure white; the rufescent medial portion of the throat much broader than in the preceding species. Length five inches and three-quarters, of wing two inches and three-quarters, and tail two inches and a half; bill to gape eleven-sixteenths of an inch, and tarse five-eighths of an inch. Bill blackish; legs pale. Inhabits Central India.[†]

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[*] I have somewhere seen this identified with *M. cantatrix.*

[†] Add 4. *C. unicolor,* Nobis. Vide *Addenda* to *Appendix* of present *Report.* I annex identifications of most of Capt. Tickell's other species, described in the same paper.

No. 1, *Hyptiopus lophotes;* 2, *Circus æruginosus;* 3, *C. melanoleucos,* young; 4, a good species; 5, *Ketupa Leschenaultii;* 6, *Strix longimembris (?),* Jerdon; 7, *Athene radiatus,* (Tickell), — *erythropterus,* Gould,—*perlineatus,* Hodgson; 8, *Ninox scutulatus* (Raffles), v. *hirsutus* (Tem.); 9, *Ceblepyris melaschistos;* 10, *Tricophorus virescens,* Jerdon, v. *Ixos Psidii,* apud nos, p. 181* *ante;* 11, *Dicrurus cærulescens;* 12, *Tephrodornis superciliosus;* 13, *Brachypus melanocephalus* of Hardwicke and Gray, vide *J. A. S.* XI, 792; 14, *Cometes krishna;* 15, *Muscicapa picata;* 16, *Pericrocotus princeps;* 17, *Cyornis Tickelliæ,* Nobis, *supra;* 18, 19, the names refer to the same, *Muscicapa cærulea,* Vieillot; 20, —— ?; 21, *Pericrocotus peregrinus;* 22, *Saxicola caprata (?);* 23, *Copsychus saularis;* 24, *C. macrourus,* — *Kittacincla* of Gould; 25, *Cyanecula Suecica;* 26, *Calliope Lathami;* 27, probably *Mixornis* (Hodgson) *chloris,* vide XI, 794; 28, —— ?; 29, *Prinia macroura;* 30, *Sylvia Indica,* apud Jerdon; 31, —— ?; 32, *Thamnobia fulicata;* 33, *Iora typhia;* 34, *Geocichla citrina;* 35, a good species; 36, *Oriolus Hodgsonii,* Sw., young male; 37, *Nectarinia Goalpariensis;* 38, *Dicæum Tickelliæ,* Nobis; 39, *Chloropsis cæsmarhynchos,* vide p. 956; 40, probably *Emberiza fucosa, J. A. S.* XI, 601; 41, *Spermestes leuconotus;* 42, *Parisoma vireoides* of Jerdon's list; 43, *Pyrgita concolor?* ditto; 44, *Pyrgita flavicollis;* 45, *Picus Goensis,* fœm.; 46,

To these must be approximated *Saxicola nigrorufa,* Jerdon, *Madr. Jl.* 1842, p. 189; vel *Muscicapa rufula,* de la Fresnaye, Ad. Delessert, *Souvenirs,* &c, pt. ii, 29; which probably will be eventually found to exemplify another of these small natural divisions, intermediate to the last and to the Stonechats.]

I shall now refer to my former paper on a collection of birds from the same locality (Vol. XI. p. 160, *et seq.*), certain of which, introduced as new, I have since succeeded in identifying with previous descriptions, and some of my efforts at monographing various groups I can now render more complete, from having subsequently received accessions, more or less considerable, to the number of their comprised species.

Vol. XI, p. 160. *Falco Aldrovandi,* v. *severus,* Horsfield. The Darjeeling male appears to have been rightly assigned to this species; but the supposed female and young are distinct: and the Neilgherry small Falcon mentioned in a note to p. 162, proved to be *F. vespertinus* v. *rufipes,* vide p. p. 881-2.*

P. 165. Several small Owls are mentioned, of which the *Strix scutulata,* Raffles, *Str. hirsuta,* Temminck, *Str. lugubris,* Tickell, and it may be added *Ninox Nipalensis,* Hodgson, are one and the same.

P. 166. I have deemed it worth while to publish a figure of the Yellow-backed Honeyguide (*Indicator xanthonotus,* Nobis), which will shew that that species is correctly referred to its genus, of which it was assuredly little suspected that any representative would inhabit the Himalaya.

P. 168. *Cuculus micropterus.* In my description of this Cuckoo (*J. A. S.* XI, 903), I considered certain dark ash-coloured specimens to be merely the old birds of this species, an opinion to which I still adhere. Mr. Hodgson, however, thinks differently, having lately forwarded similar examples by the designation *C. saturatus.* One sent as the

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P. aurantius; 47, *P. Mahrattensis;* 48, *Dendrophila frontalis,* v. *Sitta corallina,* Hodgson; 49, *Buceros Malabaricus* verus; 50, correct; 51, probably a species closely allied to *Bucco viridis,* v. *caniceps,* of which I have information; 52, *Trogon Malabaricus ?;* 53, *Caprimulgus* —— ?; 54, *Macropteryx longipennis;* 55, *Carpophaga œnea;* 56, *Columba meena;* 57, 58, 59, correct; 60, *Parra Indica,* immature.

* The *Falco Aldrovandi* has recently been described in McClelland's Journal, (1843, page 283,) as *F. rufipedoides.* *F. vespertinus* I have lately obtained in this neighbourhood.

young appears to me to be a female in the plumage corresponding to the *hepaticus* variety of *C. canorus*, which is so prevalent also in the following species.

Same page. For *Cuculus Sonneratii,* read *C. poliocephalus*, Latham, vide p. 904. Both of these species (i. e. *micropterus* and *poliocephalus)* have recently been obtained in southern India by Mr. Jerdon.

Mr. Hodgson has also forwarded an apparently distinct species by the appellation *C. nisicolor*, to which I have no hesitation in referring the young specimen from Macao mentioned in a note to p. 240, *ante.* It is closely allied to *C. fugax*, from which it is chiefly or wholly distinguished by its much deeper colouring. Mr. Hodgson's example would appear to be a remarkably small one, and is probably a female; but the difference of size between it and the young specimen from Macao is not greater than occurs in the respective series of *C. canorus* and *C. micropterus* now lying before me. Length about twelve inches and a half, of wing six inches and five-eighths, and middle tail-feathers five inches and three-quarters; bill to gape an inch and three-sixteenths. Colour of the upper-parts very dark pure ash-colour; throat and cheeks the same, as in *C. fugax:* under-parts and tail also as in the latter species; but the flanks not barred (in the specimen): throat below the chin contrasting with the dark ashy above and laterally, and the central marking of the feathers of the throat deep ash, like the rest of this colour, it being very dark on those of the fore-neck. The Macao specimen is moulting its tail-feathers, but has the wing seven inches and a half long, being probably a young male. Cap, with the throat, ear-coverts, and sides of the neck, very dark ashy, and several white feathers on the nape, as in some young examples of *C. fugax;* interscapularies dusky ash, very faintly rufous-barred, imparting a shade of that colour to the part; scapularies, tertiaries, and wing-coverts, successively more distinctly barred with bright rufous; the fore-neck tinged and the plumage of the breast tipped with the same; and the under-parts longitudinally streaked throughout with dusky, shewing no trace of bars on the flanks: lower tail-coverts dull white: bill and feet as in *C. fugax.*

Since the Supplement to my Monograph on Cuckoos was published (p. 240 *ante),* Mr. Jerdon has favored me with copies of the descriptions of *Cuculidæ* in Lesson's *Traité.* The *C. fugax* is there described by the specific name *tenuirostris*, which term is applied by Gray in Hardwicke's Illustrations to the female of *C. niger*. *C. flavus* is described from Bengal and Java, the *niger* being thus regarded as identical with it (vide p. 241 *ante;*) and a variety (?) is mentioned, only half the size, but presenting no other difference. There is also described a *C. lineatus:* "like *C. flavus*, but larger; above browngrey, darkest on wings and back; beneath rufous, barred with black; tail brown above, edged with white beneath. East Indian Isles."*

The *C. (Chrysococcyx) lucidus*, (vide XI, 917,) would appear to be Himalayan. At least a specimen occurs in a collection formed partly in the Himalaya, and partly in central India, presented to the Society by C. Fraser, Esq.; and a member of this group is mentioned in a catalogue of Nepalese birds forwarded by Mr. Hodgson.

C. (Chrysococcyx) chalcites? (XI, 919). A specimen which I presume to be the adult male of this species, from Macao, considerably resembles the young of *C. lucidus*, and may be described as follows. Length about five inches and three-quarters, of wing three inches and a half only, and tail two inches and a half; bill to gape three-quarters of an inch, and tarse exceeding half an inch, being feathered for only the upper third. Upper-parts metallic green, not very vivid, and much bronzed: lower-parts white, transversely barred with the colour above: tail having an obscure subterminal dusky bar, beyond which, on the extremity of the inner web of each feather save the middle pair, is a white spot; the rest of the inner webs of the outer tail-feathers are barred black and white, successively less defined and more tinged with rufous as they approach the middle pair: bill blackish, with some yellow at the base of the upper mandible; and legs also dark.

To return to M. Lesson's Cuckoos, it appears that *Phœnicophæus calorhynchus (J. A. S.* XI, 1098,) is identical with *Zanclostomus Javanicus;* and the *Piaya erythrorhyncha*, Lesson, would seem to be referrible to the same. *Taccocoa Leschenaultii* appears to be identical with *Zanclostomus sirkee*. The *Phœnicophæus lucidus*, Vigors, *Ph.*

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* Two specimens from Chusan differ only from the Indian bird in their rather smaller size, though the beak appears fully as large. Both are in the plumage which I have described as the second dress of the male *C. niger*, having the under-parts rufous from the breast, and one of them retaining some of the barred nestling feathers upon its wings. Length of the wings (in both) four inches, and of tail four inches and one-eighth. Of the Bengal bird, I have recently obtained female speci-

Crawfurdii, Gray, and *Calobates radiceus*, Temminck, I have still no means of referring to.

Of *Centropus Phillipensis*, M. Lesson mentions a variety (?) from Sumatra, only half the usual size: body above dull brownish-black; wings dirty rufous.* His young or female from Bengal would seem to be a state of plumage of *C. lepidus:* "size of a Magpie; plumage brown, spotted and zoned with blackish brown, streaked with white on the fore-part of the neck; tail brown above, rayed with whitish." *C. pumilus* is doubtless *C. Bengalensis*, Latham, thus described from specimens in the Paris Museum: "Male size of a Thrush; bill black with a white spot; tarsi brown; plumage brown-black tinted with rufous; tail wedged, broad, brown: from Java (!): female—a little larger

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mens in the green-glossed dark ashy plumage, with ferruginous under-parts from the breast, one of them having the latter much brighter than in any male I have yet seen, the feathers of its breast being also partially tipped with the same; another female with uniformly dark upper-parts, has the entire under-parts scantily banded with dull rufous, and traces of the same also on the forehead and above the eyes; a third female tends towards the *hepaticus* variety of plumage, having the upper-parts dark, with rufous bars, which are darker and less conspicuous on the back and scapularies, but vivid and strongly marked on the wing-coverts and tail, the rump dark with faint traces of rufous, and the entire under-parts pale and weak ferruginous, with narrow dusky cross-bars, except on the under tail-coverts and towards the vent; a fourth female, in the true *hepaticus* plumage, with a ferruginous rump, is that described as exhibiting the mature female livery, in XI, 909. Well may M. Lesson designate this bird (or an allied smaller species resembling it) a "perfect Proteus."

* Such a specimen I have now before me from Chusan, of the size and with the form of beak of *C. lepidus*, but the colouring of *C. Phillipensis*, only the rufous is not so bright, being washed with fuscous especially on the tertiaries, and the stems of the dorsal feathers are more coarsely spinous and glistening. Length about fourteen inches, of which the middle tail-feathers measure seven and a half, the outermost nearly four inches less; wing six inches: bill to gape an inch and one-eighth, and nine-sixteenths of an inch in greatest vertical depth; tarse an inch and a half; and long hind-toe and claw an inch and three-fourths. Should this not be named, I propose to designate it *C. dimidiatus*.

C. lepidus extends into Nepâl, a specimen from that country having been forwarded by Mr. Hodgson; and an example of the young in first plumage, from the Malay peninsula, may be described as follows:—Upper-parts light chestnut, handsomely barred with black, these bars more narrow on the wing-coverts, primaries and secondaries; tail green-glossed black, with narrow rufous cross-bars; crown and neck above longitudinally striated, the spinous shafts of the feathers little developed, and their lateral margins black: under-parts pale fulvescent, with slight dusky barring on the flanks, and spots of the same on the sides of the neck: bill pale yellowish-horn, the ridge of the upper mandible reddish-brown. M. Lesson's Bengal specimens above noticed would not appear to differ materially.

than the male; bill horny: plumage reddish white, rayed with brown; wings bright rufous; tail long, much wedged, brown, edged with reddish-white: Sumatra.

" *Centropus bicolor;* Paris Museum. Bill and tarsi black: plumage smoky greyish-white, darkest on head, back, and wings, brightest on throat and breast; belly and anal region tinted with reddish-ochreous: tail cinnamon-rufous. Celebes, Moluccas.

" *C. melanops;* Paris Museum. Size of *C. Senegalensis:* bill and tarsi black: forehead, cheeks, and around the eyes, intense black; throat white; neck and breast ferruginous; abdomen and anal region dull black; back rust-coloured; wings chocolate; tail bluish-black.-Java."*

P. 169 *et seq.* For a more complete monographic notice of the Indian Drongos, vide p. 799 *et seq.*, also p. 180 *(bis)* of the present volume. Mr. Hodgson has, however, sent specimens of *Dicrurus balicassius* verus, as his *annectans;* and has also forwarded from Nepâl *D. Fingah, macrocircus,* and *cœrulescens.*

P. 175. The following is a more complete list of the species of *Pomatorhinus.*

1. *P. erythrogenys,* Vigors, *P. Z. S.* 1831, p. 137, and figured in Gould's *Century;* pl. LV. Himalaya.

2. *P. montanus,* Horsfield, *Lin. Trans.* XIII, 165, and figured in the 'Zoological Researches in Java' of that naturalist. Java.

3. *P. schisticeps,* Hodgson, *As. Res.* XIX, 181; *P. leucogaster,* Gould, *P. Z. S.* 1837, p. 137. Himalaya, Assam.

4. *P. Horsfieldi,* Sykes, *P. Z. S.* 1832, p. 89. Neilgherries.

5. *P. ruficollis,* Hodgson, *As. Res.* XIX, 182. Himalaya.

6. *P. trivirgatus,* Temminck, *Pl. Col.* 443; figured also in the 'Illustrations of Ornithology' of Sir W. Jardine and Mr. Selby, pl. LXIX. Australia.

7. *P. turdinus,* Temminck, *Pl. Col.* 441. Australia.

8. *P. temporalis,* Vigors and Horsfield, *Lin. Trans.* XV, 330. Australia.

9. *P. superciliosus,* Vigors and Horsfield, *Ibid.* Australia.

10. *P. rubecula,* Gould, *P. Z. S.* 1837, p. 137. Australia.

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* For further descriptions of Asiatic *Cuculidæ,* vide XI, 897 and 1095, also p. 240, *ante.*

11?. *P. frivolus; Turdus frivolus,* Latham, Vieillot; Australia: referred to this genus by Mr. G. R. Gray, *Mag. Nat. Hist.* 1843, p. 192. The Mexican *Orpheus longirostris,* Swainson, is strangely referred to *Pomatorhinus* by M. Temminck in his *Planches coloriées,* vide *Fauna Americana-borealis,* II. 191. Probably one of the subsequently described Australian species will prove identical with *P. frivolus;* this genus having been originally constituted upon a single species.

In Dr. Horsfield's catalogue of the Assamese birds procured by Dr. McClelland, *P. Z. S.* 1839, p. 166, *P. montanus* is included, with the remark that "no essential difference is apparent between a specimen of this bird sent from Assam and the specimens obtained in the Island of Java, from which the original description was made." A drawing, however, in Dr. McClelland's possession, taken from the only specimen of this genus which was procured by him, refers distinctly to *P. schisticeps;* a species which undoubtedly is nearly allied to *P. montanus,* as is also the *P. Horsfieldi,* but all three present constant differential characters, as follow:—

In *P. montanus,* the whole back and scapularies, with the nape, are bright chestnut-rufous; crown and sides of the head schistaceous; and a superciliary streak reaching to the occiput, with the entire under-parts to near the vent, vivid white, the latter flanked with rufous.

In *P. schisticeps,* the rufous is confined to the immediate border of the white under-parts; the neck, back, and scapularies, being wholly olivaceous: in other respects like the preceding. The young, too, present no difference of colour, further than that the crown is browner; their wings and tail being also shorter, and the clothing plumage flimsy, at least in part.

In *P. Horsfieldi,* the rufous is constantly wanting altogether, besides which the white extends but little beyond the breast, which is flanked with dusky: in other respects it resembles both the others.

The geographic locations of these three species are different; and the Himalayan *P. schisticeps* is the most likely of them to occur in Assam.

Same page. My genus *Xiphirhynchus* being identical in name with Mr. Swainson's *Ziphorhynchus,* I change it to *Xiphorhamphus,* and supply a figure of the species upon which it is founded.

P. 177. I also give a representation of *Paradoxornis ruficeps;* but regret to add that the artist (for whom I furnished a rough sketch) has made it look rather too large, from the hardness of the back-outline in particular, the feet are coarse and ill-drawn, and the wing from bend should be three-eighths of an inch longer, the addition being made in front. This species occurs at Darjeeling.

P. 178, *et seq.* Genus *Garrulax,* Lesson; *Crateropus,* Swainson; *Ianthocincla,* Gould; *Cinclosoma* (in part), Vigors, Hodgson. During the short time that has elapsed since I published a synopsis of the species of this genus then known to me, the Society's Museum has been greatly enriched by a splendid donation from Mr. Hodgson, which comprised most of the species described by that naturalist, and brought the number of those contained in the Society's collection to fifteen, exclusive of *Nipalensis,* which Mr. Hodgson has since classed in his genus *Alcopus* (olim *Sibia*), vide *J. A. S.* VIII, 38, but now founds upon it his genus *Ixops.* The Society has since also received the Neilgherry *G. cachinnans* from Mr. Jerdon, and a new species from Capt. Phayre, Commissioner of Arracan. By some oversight, I omitted on that occasion to include the *G. setafer,* Hodgson; and now that this gentleman has supplied the Society with specimens of the bird so named by him, I find that a Bootan species in the museum which I had doubtfully identified with it, though nearly allied, is distinct from it, besides which are other new species comprised in the following conspectus of the oriental members of this group, with which I am at present acquainted.

1. *G. leucolophos; Corvus leucolophos,* Gmelin: figured in Gould's *Century,* Pl. XVIII. Himalaya.

2. *G. Belangeri,* Lesson, *Zoologie du Voyage de M. Bélanger,* p. 258, with coloured figure: *Ianthocincla leucolophos ?,* Var., Nobis, *J. A. S.,* X, 924. Common in the Tenasserim provinces, and procured by M. Bélanger in Pegu.

3. *G. rufifrons,* Lesson, *Ibid.,* with also a coloured figure. Java.

4. *G. perspicillatus,* G. R. Gray; *Turdus perspicillatus,* Gmelin, — Shaw's *Zoology,* X. 325: *le Merle de la Chine,* Buffon. China.*

5. *G. auritus; Corvus auritus,* Latham; *Spreo auritus,* Lesson, *Traité*†: *Crateropus leucogenys,* Nobis, *J. A. S.* XI, 180; *le petit*

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* Mr. G. R. Gray appears to consider this as identical with *G. Belangeri,* but Shaw's description of it would hardly seem to apply to the latter.

† *Spreo* of Lesson is founded on *Turdus bicolor* of Gmelin, apud G. R. Gray.

Geai de la Chine, Sonnerat. The specimen described by me was brought, as I have since learned, from China, which is the habitat assigned to the species. *Vide* p. 179 *(bis) ante,* for some particulars concerning the individual as observed in captivity.

6. *G. Reinwardii; Crateropus Reinwardii,* Swainson, *Ill. Zool.,* 2nd series, II. pl. LXXX. Believed to be Malayan.

7. *G. albogularis; Ianthocincla albogularis,* Gould, *P. Z. S.* 1835, p. 187: *Cinclosoma albigula,* Hodgson, *As. Res.* XIX, 146. Nepâl, Bootan.

8. *G. gularis,* McClelland and Horsfield, *P. Z. S.* 1839, p. 159. Assam.

9. *G. pectoralis,* Gould, *P. Z. S.* 1835, p. 186; *Cincl. grisaure,* Hodgson, *As. Res.* XIX, 146. Nepâl.

10. *G. moniliger; Cincl. moniliger,* Hodgson, *As. Res.* XIX, 147. Not readily distinguishable from the preceding species, but inferior to it in size, having the wing considerably shorter, the breast-marking generally less developed, and the tail-feathers less deeply tipped with white; the ear-coverts also have less white on them, which is confined to their lower and central portion. Nepâl, Bootan.

11. *G. melanotis,* Nobis. Still more nearly allied to *G. pectoralis,* but having the ear-coverts wholly black, forming a large and conspicuous patch; whereas in the other they are silvery-white, slightly surrounded with black; the lateral tail-feathers are also still more deeply tipped with white, and the uppermost longest tertiaries have a white spot on their inner web. Arracan.

12. *G. McClellandii,* Nobis; *Ianthocincla pectoralis,* Gould, apud Horsfield, *P. Z. S.* 1839, p. 160. Assam. Neither in Dr. McClelland's description of this bird *(loc. cit.)*, nor in his coloured drawing of it, is any notice taken of the bright rufous nape of the three foregoing species, nor of the white streak edged inferiorly with black over the eye, nor of the conspicuous whitish ear-coverts of *G. pectoralis,* nor of the greyish-white edgings to the outer primaries; the whole of which are much too obvious to be overlooked in that species. Hence I feel little doubt that the present is a different bird from either of its foregoing nearly allied congeners.

13. *G. lunaris; Ianthocincla. lunaris,* McClelland and Horsfield, *P. Z. S.* 1839, p. 160. Assam.

14. *G.* [*ruficollis ;*] *Corvus pubduya,* Buchanan Hamilton. Nearly allied to the last, which it resembles in the semi-lunar mark on the sides of the neck. Length about nine inches and a half. General colour olivaceous-brown, darkening on the tail, and passing into ash-colour on the crown and occiput: forehead, ear-coverts (including the orbital region), throat, and fore-neck, black: a crescent-like mark of rufous on the sides of the neck, and under tail-coverts the same. Irides red. Bill black; and legs dusky. Described from a beautiful and highly finished drawing, sketched evidently from life, among those of the late Dr. Buchanan Hamilton. Habitat not stated.*

15. *G. variegatus ; Cincl. variegatum,* Vigors, *P. Z. S.* 1831, p. 55, and figured in Gould's *Century,* Pl. XVI. Nepâl.

16. *G. affinis,* Hodgson. *M. S.* Nearly allied both to the last, and (judging from description) to the next species. Length about ten inches, of wing four inches, and middle tail-feathers four inches and three-quarters, the outermost an inch and a half shorter; bill to forehead (through the feathers) an inch, and to gape an inch and one eighth; tarse an inch and a half. General colour rufescent olive-brown, more or less distinctly mottled on the back with paler tips to the feathers; the rump dingy greenish, and upper tail-coverts rufous: sides of the head, lores, cheeks, and ear-coverts, black, occasionally suffusing the crown; chin the same, and a broad moustachial spot, with another behind the ears, white: breast rufous-brown, the feathers laterally edged with grey; belly uniform fainter rufous-brown, and lower tail-coverts darker: the wings have a jetty-black spot, formed by the coverts of the primaries; and the winglet, with the exterior margins of the primaries, is pearl-grey; those of the secondaries and tertiaries partly are greenish-yellow, much as in *G. chrysopterus,* the remainder of the tertiaries and tips of the secondaries being slaty-grey; anterior portion of the wing coloured like the back; and basal two-thirds of the tail dull greenish-orange, the rest slaty-grey: bill black, and feet pale brown. Inhabits Nepâl.

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* This would seem to be the *Ianthocincla ruficollis* of Jardine and Selby's 2nd series of Illustrations, which I have not seen ; to judge from the following diagnosis sent me by Mr. Jerdon. "*I. fronte, genis, auriculis, gulâ, superiore pectoris, nigris ; capite superiore colli griseis ; lateribus colli crissoque rufis : colore colli maculâ curvatâ extendente ad gulam, corpore alisque olivaceo-griseis, remigibus marginibus griseis ; caudâ nigrescente. Hab.* Himalayas."

17. *G. capistratus; Cincl. capistratum,* Vigors, *P. Z. S.* 1831, p. 55. Himalaya.

18. *G. chrysopterus; Ianth. chrysoptera,* Gould, *P. Z. S.* 1835, p. 48. Bootan, Nepâl.

19. *G. erythrocephalus; Cincl. erythrocephalus,* Vigors, *P. Z. S.* 1831, p. 171, and figured in Gould's *Century,* pl. XVII. Nepâl.

20. *G. rufogularis; Ianth. rufogularis,* Gould, *P. Z. S.* 1835, p. 48: *Cincl. rufimenta,* Hodgson, *As. Res.* XIX, 148. Nepâl.

21. *G. ocellatus; Cincl. ocellatum,* Vigors, *P. Z. S.* 1831, p. 55, and figured in Gould's *Century,* pl. XV. Nepâl.

22. *G. squamatus; Ianth. squamata,* Gould, *P. Z. S.* 1835, p. 48, and figured in Jardine and Selby's 2nd series of *Illustrations: Cincl. melanura,* Hodgson, *As. Res.* XIX, 147. Nepâl.

23. *G. cœrulatus; Cincl. cœrulatum,* Hodgson, *As. Res.* XIX, 147. Nepâl.

24. *G.* [*phœniceus;**] *Crateropus puniceus,* Nobis, *J. A. S.* XI, 180. Bootan, Darjeeling.

25. *G. lineatus; Cincl. lineatum,* Vigors, *P. Z. S.* 1831, p. 55. Nepâl?

26. *G. setafer; Cincl. setaferum,* Hodgson, *As. Res.* XIX, 148. Nepâl.

27. *G. imbricatus,* Nobis. Length eight inches and a half; of wing three inches; and middle tail-feathers four inches, the outermost an inch and a quarter less: bill to forehead (through the feathers) three-quarters of an inch, and to gape seven-eighths of an inch: tarse an inch and one-eighth. General colour olive-brown, darker on the crown, paler and a little inclining to rufous underneath; the rump and flanks dingy olive-green; and tail slightly rufescent above, its exterior feathers successively more broadly sub-terminated with dull black, having their extreme ends whitish: plumage of the head, neck, and back, slightly rigid to the feel, recalling to mind that of a Coucal (*Centropus*), which is also the case, in a slighter degree, in the preceding species, more particularly on its crown: the feathers of the crown and neck have shining black shafts, and, together with those of the nape, are slightly margined with dull olive-green; lores albescent, and the ear-coverts, sides of the neck, and under-parts, are more or less white-

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* Mr. Jerdon informs me that this bird is the *Xanthocincla phœnicea* of Gould, figured in his *Icones Avium.*

shafted, chiefly towards the tips of the feathers; primaries inconspicuously margined with grey, and secondaries with yellowish-olive: bill and feet olive-brown. Inhabits Bootan.

28. *G. cachinnans; Crateropus cachinnans*, Jerdon, *Madr. Jl.* No. XXV, 255 (1839), and there figured: *Cr. Lafresnayii*, Ad. Delessert, *Souvenirs d'un Voyage dans l'Inde*, pt. II, 30; and, it would appear, *Cr. Delesserti*, de la Fresnaye, *Rev. Zool. par la Soc. Cuvierenne.* Neilgherries.

29. *G. Delesserti; Crateropus Delesserti*, Jerdon, *Madr. Jl.* No. XXV, 256 (1839): *Cr. griseiceps*, Ad. Delessert, *Rev. Zool. par la Soc. Cuv.* 1840, p. 101, and Deless. *Souvenirs*, &c. pt. II, 29. Neilgherries.

30? and 31? In the catalogue of Dr. Royle's birds procured at Saharunpore and the neighbouring districts of the Himalaya, *G. leucolophos* is noticed as inhabiting the lower hills, and two other species are mentioned of which I have seen no description; viz. *melanocephalus*, on the hills, and *striatus*, met with in the Kheree Pass. Whether these be distinct from all the foregoing, remains to be ascertained.*

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* In a list of specimens now on their way from Mr. Hodgson, I find three species mentioned, by the names *leucopophlus* (Quære *leucolophos*), *erythropterus*, and *subunicolor*; this last, with *setafer* and others, constituting Mr. Hodgson's division *Trochalopteron*, the propriety of adopting which name will depend on whether Mr. Swainson's *Crateropus Reinwardii* be considered admissible into the group, in which case it must bear the appellation *Crateropus*.

The specimens adverted to have since arrived, but *Tr. leucopophlus (?)* and *erythropterus* are not among them; and of *Tr. subunicolor*, a nestling specimen only is sent, of a species nearly allied to *Tr. erythrocephalus, chrysopterus*, and *affinis*, especially to the latter, but having a shorter and thicker bill than in that bird. In a nestling example of *Tr. chrysopterus* before me, the lunate black spots on the breast of the adult do not exist, beyond a mere trace of them on the sides of the breast; being the contrary of what is observable in the Thrush and various other groups, wherein the young are more mottled than the adults. Length of the immature *subunicolor* about nine inches, of the wing three inches and a half, and tail four inches; bill to gape seven-eighths of an inch, and tarse an inch and three-eighths. General colour greenish olive-brown, tinged with dusky on the head, and brighter greenish on the tertiaries and tail, the latter having a slight wash of aureous; exterior tail-feathers dusky with white tips, the latter successively increasing to the outermost; edges of primaries bright golden-yellow, as in *affinis*, but the narrow exterior edge of the outer primaries greyish beyond their emargination; lower-parts dull olive-brown: the dorsal plumage is slightly margined with black, in the adults probably as much so as in *squamatus*; and two or three new feathers growing on the breast are whitish towards the tip with a dusky margin, indicating that the under-parts of the adult would be thus mottled: bill dusky above, the under mandible yellowish except at tip; and feet brown. Nepal.

The only additional species which I at present know of, are four described from Western Africa by Mr. Swainson, and one discovered in Southern Africa by Dr. A. Smith:* there are doubtless, however, several more yet to be discovered in this country. Of those here enumerated, Nos. 3, 4, 6, 8, 12, 13, 14, 15, 17, 25, and 29, are desiderata in the Society's Museum; which contains only bad specimens of some of the others, as 22 and 23. The *Cincl. Nipalense*, Hodgson, as before noticed, has since been referred by that naturalist to his genus *Alcopus* (v. *Actinodura*, Gould); and now ranks as the type of his genus *Ixops*.

Leiocincla, Nobis. *n. g.* Intermediate to *Garrulax*, *Ixops*, and *Leiothrix*, the very elegant bird upon which I found this generic designation has the bill shorter than the head, moderately compressed, somewhat wide at base, the outline of both mandibles accurved, and the tip of the upper bent over that of the lower mandible, rendering the slight arcuation of the former more apparent: nostrils basal, their aperture a narrow slit at the inferior margin of the nasal membrane: gape furnish with a few long but feeble bristles. Tarse of mean length, or rather short than otherwise: the toes formed for perching, and claws of moderate size. Wings having the first primary half the length of the third, and the fifth, sixth, and seventh, equal and longest. Tail long and graduated. The plumage very copious, dense and of silky texture, especially on the crown and occiput, where the feathers are much lengthened.

L. plumosa, Nobis. Entire length about nine inches, of which the tail measures five, its outermost feathers two inches less; wings three inches and three-eighths; bill to forehead, through the reflected frontal plumes, three-quarters of an inch, and seven-eighths of an inch to gape; tarse an inch. General colour different shades of soft brown, passing into rufous and delicate cinerous-lake; the latter prevails on the lengthened feathers of the crown and nape, and upon the

The *Turdus canorus*, Lin., is referred to *Ianthocincla* by Mr. Strickland, in a list of Chinese birds published in the 'Annals and Magazine of Natural History' for September 1843. This is the *Baniahbou de Bengale* of Buffon, who appears, however, to mix up two different species under this name, from Bengal and China respectively. I do not recognise the Bengal bird described by him, but may remark that the native name he cites is commonly applied to the Black-headed Oriole.

* *Crat. Swainsonii*, A. Smith, may be one, the figure of which I have not seen; but *Cr. Jardinii* of the same naturalist would seem to be a *Malacocircus*.

ear-coverts; forehead deep reddish-brown, and throat tinged with the same: back and rump a rich and less rufous brown than the forehead, the rufous much increasing in intensity on the medial part of the wings, especially on the basal portion of the primaries and on the coverts of the secondaries; the coverts of the primaries and inner webs of the winglet-feathers are black; primaries having their inner webs dusky, and the narrow outer webs of the three first albescent-grey without markings; the terminal half and successively more of the other primaries being beautifully barred with black on a pale rufescent-ashy ground, and the secondaries and tertiaries with narrower black bars on a more rufous ground, this colour however again weakening on the exposed tertiaries: tail somewhat dark ruddy-brown, all but its middle pair of feathers banded with weak dusky, and passing into the latter towards the tips, which are white, successively decreasing in quantity to the middle pair; underneath, the transverse bars are only seen towards the tips of the tail-feathers, becoming there very distinct, and ending in dusky-black, which contrasts with the white extreme tips. Under-parts much paler than the back, but softly tinted, and tinged with the predominating rufous hue. Bill light horny; and legs pale brown. The colours of this species recall to mind those of the Wax-wings *(Bombycilla)*, and are equally delicate. In the barred markings of its wings, the character of the crest, and other details of plumage, it manifests considerable affinity for *Ixops Nipalensis;* the feathers of which are however much less delicate and silky. Inhabits the vicinity of Darjeeling.

P. 181. My genus *Cinclidium* proves to be less allied to *Pellornium* than I had anticipated; and I now supply a figure of the species (*C. frontale*, Nobis), upon which it is founded. The bird is reported to be a fine songster, heard chiefly in the evening.

P. 183. *Pteruthius rufiventer*, Nobis. I described this species from a female example, and have now the pleasure of adding a notice of the plumage of the male. Length eight inches, of wing from bend three inches and five-eighths, and of tail three inches and a half, its outermost feathers an inch and a quarter shorter. Back and upper tail-coverts wholly deep ferruginous, as also the tips of the secondaries, of the longest tertiary, and of all the tail-feathers: head and nape, lores, ear-coverts, and infra-orbital region, deep black, glossed along the edges of each feather; throat, fore-neck, and breast, pure ashy; and the rest of the under-parts, from the breast, a pale brownish-carneous, with a patch of golden-yellow on each side of the breast, bordering the grey: wings and tail wholly shining black, except the ferruginous tips before mentioned. The sexual diversity is accordingly considerable, the female having the upper-parts, wings, and middle tail-feathers, green, and only the upper tail-coverts ferruginous, together with the tips of the tail-feathers; and the sides of the head grey, which margins also the feathers of the crown. Some nestling feathers intermingled on the crown of one female specimen, show that that part is also green, having slight black edges, in the young bird.

P. 184. Indian *Leiotrichanæ.* A Monograph of this group, by Mr. Hodgson, with additions and annotations by myself, is now awaiting publication.

Same page. Parus flavocristatus, la Fresnaye, *Mag. de Zool.* Janvier, 1837, apud Horsfield; *Ibid,* 1838, apud Lesson, *Revue Zoologique par la Societé Cuvierienne,* 1839, p. 42: *P. sultaneus,* Hodgson, *Ind. Rev.,* April, 1837, p. 81. This, and the *Melanochlora Sumatrana,* Lesson, *Rev. Zool.* &c., *loc. cit.*, appear now to me to be identical, my description of the latter in XI, 792, referring to the young. I have now before me four specimens from Nepâl and four from Singapore; and there is no difference in the length of the wings and tail, in the size of the bill, nor in any other respect that I can perceive, further than that the mode of preparing the Singapore specimens makes them appear considerably smaller.

Same page. Mr. Hodgson has rightly instituted a genus *Alcurus* for the species which I described by the name *Tricophorus striatus.*

P. 186. *Chloropsis Hardwickii* is referred to *Chl. curvirostris,* Swainson, by M. de la Fresnaye, apud M. Adolphe Delessert, *Souvenirs,* &c., pt. II, 23, where a figure is given of it: *Chl. auriventris, Mag. de Zool.,* Guérin, 1840, p. 17, may be added to the synonyms collated in *loc. cit.*

There are five species of this genus now in the Society's Museum, one of which appears to have been confounded with *Chl. aurifrons;* a sixth also inhabits India.

1. *Chl. curvirostris,* Swainson, or perhaps *Hardwickii* has still the priority. This species has always more or less orange-saffron colour

on the abdominal region, which in old males occupies the entire under-parts from the breast, with the exception of a little green on the flanks posteriorly; these have also the tail and greater portion of the wing dark purple, the tertiaries and adjoining coverts only remaining green, and the flexure of the wing verdigris-blue: throat and fore-neck black, passing into dark glossy purple on the breast: a large brilliant smalt-blue streak from each corner of the lower mandible; and the head and neck tinged with yellow. In younger males, the purple of the wings commences on the smallest coverts, and there is sometimes an admixture of this hue upon the tail. Females have less orange-saffron on the abdominal region, which is more or less patched with this colour, and the throat and breast are green, with the moustache-streaks less vivid than in the male. Nepâl, Bootan, Assam.

2. *Chl. aurifrons;* figured as *Chl. Malabaricus* in Messrs. Jardine and Selby's 'Illustrations of Ornithology,' as subsequently corrected by them in their Monograph of the genus. Has the crown brilliant orange, or saffron-red, the feathers rigid and glistening; throat wholly glistening smalt-blue; fore-neck black, surrounded by a yellow zone; wing-flexure verdigris-blue; and the rest green. Two specimens marked as female by Capt. Tickell differ in no respect from the male, excepting in being rather smaller, with the blue and glistening portion of the throat-feathers less developed. The young of both sexes have the forehead merely yellowish; the fore-neck bluish-green, surrounded by pale-yellow; the blue of the throat being confined, or nearly so, to a dull verdigris moustache; and not any of this colour at the base of the wing. Inhabits Bengal, Nepâl, Arracan, and Central India (neighbourhood of Chyebassa).

3. *Chl. cœsmarhynchos,*[*] Tickell, *J. A. S.* II, 579; *Chl. aurifrons,* apud Jerdon. Similar to the last species, but having no trace of blue on the centre of the throat, which is pure black, separating two well defined moustachial streaks of brilliant smalt-blue; and there is also no yellow zone surrounding the black of the fore-neck. Female with the black of the fore-neck less extended, and surrounded by pale straw-yellowish; the same moustachial streaks as in the male, but not

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[*] This name would appear, however, to be merely a misprint for *gampsorhynchus* of Jardine and Selby.

so bright; and no brilliant orange-colour on the forehead: rest as in *Chl. aurifrons.* This is decidedly distinct from the preceding species; and if, instead of reading "throat, part of cheek, and forehead, black," we insert the word *of* before "forehead," Lt. Tickell's description perfectly applies to the present bird, which has the part in question similar to that of *Chl. aurifrons:* he appears to have confounded it, however, with the latter, which alone is frequently (and, so far as I have seen, exclusively) sold in cages at Calcutta; and the specimens here described are likewise from Central India, though Lt. Tickell has sent examples of the preceding species from Chyebassa.* Peninsula of India.

In the three foregoing species, and I believe also in the next, the bill is slightly curved, slender, and tapers to a sharp point: whereas the two last have a very different form of bill, typified by that of *Chl. gampsorhynchus* (young male *Sonneratii?*), figured by Messrs. Jardine and Selby. The fifth is, however, somewhat intermediate.

4. *Chl. Cochinchinensis ; Turdus C.*, Auct: *Melliphaga Javanica,* Horsf. "Male, with chin, throat, and gorge deep black, surrounded by a greenish yellow band, which extends through the eyes to the forehead; maxillary streak, hyacinth-blue. Female, with parts black in male of a light bluish-green, surrounded (as in male,) with yellowish band; maxillary streak light azure." Jerdon. Bill rather less elongated than in the last species. Inhabits the peninsula of India, and the Indo-Chinese and Malay countries.

5. *Chl. Malabaricus.* Considerably smaller than the others, the male having the wings and tail tinged with azure, in addition to the ordinary verdigris patch at the bend of the wing, which is unusually lustrous; head and neck wholly light yellowish, somewhat rufescent on the latter; throat and fore-neck black, surrounded by a pure light yellow zone, and a small short moustachial streak of brilliant smalt-blue. Female wholly green, except in having the blue moustachial streak, which is narrower than in the male; the throat but slightly flavescent; and there is no verdigris patch at the bend of the wing.† Young male similar to the female, except that the wings and

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* I have recently received *Chl. cæsmarhynchos* from Midnapore, so that it may be presumed to be also occasionally brought alive to Calcutta.

† Mr. Eyton states that "the female differs from the male in having the markings less distinct." *P. Z. S.* 1839, p. 102.

tail are slightly (more or less) tinged with azure. Inhabits the Malay countries; and is doubtful, at present, as occurring in Malabar.

6. *Chl. Sonneratii*, J. and S.; *Phyllornis Mullerii*, Tem.; the female *Chl. zosterops* of the Monograph by Messrs. Jardine and Selby; and the young male apparently *Chl. gampsorhynchus* of the same. Adult male having the throat, loral region, and intermediate space, intense black, with a narrow moustachial streak of smalt-blue; the bend of the wing greenish-verdigris in some, others having little or no trace of this. Female having the throat and orbits yellow, and a slight blue moustache. Inhabits Southern India and the Malay countries. Of seven adult specimens before me, two or three have the bill closely approximating that represented of *Chl. gampsorhynchus.*

A seventh inhabits the Malay countries — *Chl. cyanopogon; Phyllornis cyanopogon*, Tem.: with a short bill, only the chin black, and a long cœrulean moustache-streak.

P. 187. The bird which I designated *Heterophasia cuculopsis* is identical with Mr. Hodgson's *Alcopus (*olim *Sibia) picoides, J. A. S.* VIII, 38; but as this genus appears to correspond exactly with *Actinodura*, Gould, *P. Z. S.* 1836, p. 17, I must (provisionally at least) consider them as identical, in which case the following species would be comprised in it.

1. *Act. Egertonii*, Gould, *P. Z. S.* 1836, p. 18. Nepâl.

2. *Act. gracilis; Hypsipetes gracilis*, McClelland and Horsfield, *P. Z. S.* 1839, p. 159, which appears to me clearly referrible to this genus, from Dr. McClelland's drawing of it. Assam.

3. *Act. picoides; Sibia picoides*, Hodgson, *J. A. S.* VIII, 38; *Heterophasia cuculopsis*, Nobis, *Id.* XI, 187. Nepâl, Bootan.

4. *Act. nigriceps; S. nigriceps*, Hodgson, *loc. cit.* Nepâl, Bootan.

Same page. The *Accentor* to which I applied the name *Himalayanus* with a mark of doubt, may be now termed *A. variegatus;* as the following species of this genus also occur in the Himalaya.

A. Nipalensis, Hodgson. Allied to *A. alpinus*, as indeed are both the others, yet this most so, though intermediate in plumage to that species and *A. modularis.* Length about seven inches, of wing three inches and three-quarters, and tail two and three-quarters; bill to gape five-eighths of an inch, and tarse fifteen-sixteenths of an inch. Newly moulted adults have the upper-parts nearly as in *A. modularis,* but the dark colour predominating, and the striation of the head and neck obsolete, or very nearly so, these parts, with the ear-coverts and breast, being of an almost uniform dark brownish-grey; throat white, spotted with dusky-black, which forms two cross-bars on each feather, their extreme tips being greyish; belly and flanks bright dark ferruginous, mingled with the hue of the breast along the middle of the former; under tail-coverts dusky, tinged with ferruginous, and laterally margined with white: the feathers of the back are greyish-brown, with broad dark centres, or they may be described as blackish, with brown lateral margins, tinged with ferruginous towards and upon the scapularies: wings dusky-black, the tertiaries broadly margined with ferruginous, the other large alars slightly so, and all having a spot of this colour at the extremity of their outer edge; wing-coverts having a white spot at the tip of their exterior webs; and the small feathers near the bend of the wing coloured like the head: tail brownish-black, tipped with brown, the terminal spot of the inner web of each feather successively more albescent to the outermost; upper tail-coverts long, and brown with a dark central streak: bill dusky, the lower mandible yellow except at tip; and legs reddish-brown. In worn plumage, the margins of all the feathers have more or less disappeared, and what remains of them is faded in hue; the conspicuous white spots on the wing-coverts, and ferruginous margins of the tertiaries, being completely abraded, the former leaving a semi-circular sinus, as if artificially cut away. In this state of plumage, Mr. Hodgson has sent a specimen as distinct in species. The young have the clothing plumage of the usual flimsy texture, the under-parts coloured like the back, with no ferruginous on the belly; the spots on the wing-coverts are larger and less purely white; and the ferruginous on the scapularies and wing-coverts, dingy. Appears to represent *A. alpinus* on the Kâchar region of Nepâl.

A. strophiatus, Hodgson. Size of *A. modularis*, and readily distinguished by its bright ferruginous breast and streak over the eye. Length about five inches and a half, of wing two inches and a quarter to two and a half, and tail two inches and one-eighth to two and a quarter; bill to gape five-eighths of an inch, and tarse thirteen-sixteenths of an inch. Upper parts much as in *A. modularis*, but the colours brighter and more contrasted, and the crown and neck uniform with the back; a broad eye-streak, the first portion of which is white to beyond the eye, surmounting a ferruginous streak continued backward to the occiput; a semi-circle of the same surrounds the dusky ear-coverts, and the entire breast is also ferruginous; throat white, with dusky spots, forming a line descending from each angle of the lower mandible; belly and lower tail-coverts white with dusky streaks; wing-feathers dusky, margined with ferruginous, with an albescent spot at the tip of each covert; tail brownish, with dull rufous outer margins: bill black, and legs reddish-brown. Nepâl.

A. variegatus, Nobis, should follow *A. Nipalensis* in the series commencing with *A. alpinus;* and *A. strophiatus* should, if I remember *A. montinellus* rightly, be placed next to that species.

P. 188. *Pitta nuchalis*, Nobis, is identical with *Hydrornis* (olim *Paludicola) Nipalensis*, Hodgson, *J. A. S.* VI, 103: but it is barely separable from the great group of *Pitta*, a monograph of which would be acceptable at the present time. The following is a slight contribution towards its effectuation.

In India, there appears to be only one species generally distributed, viz. *Pitta brachyura*, Auct., figured in Gould's Century. I kept a bird of this species for some time alive, but can remark little more than that it progressed by hopping, and that it is a remarkably silent species; though I am told that it frequently utters a screeching note in the wild state. Allied to it is a beautiful species common in the Malay countries, for which I have been unable to find a name, but can scarcely suppose it undescribed; viz.

P. Malaccensis? Nobis. Nearly similar to *P. brachyura*, but considerably larger, and everywhere much brighter-coloured; the wings much more largely marked with brilliant smalt-blue instead of verdigris-blue; the back a purer dark green; under-parts brighter fulvous; and belly and lower tail-coverts vermillion; under surface of wings black, without the white spot at the bend observable in *P. brachyura*, but the white patch on the quills much more largely developed, three of the secondaries being wholly of this colour.*

P. nigricollis, Nobis. Resembles the *P. strepitans*, Tem., of Australia, except that the under-parts are bright sea-green, and that there is generally no trace of black on the centre of the crown. Length above seven inches, the wing four inches and a quarter to four and a half; bill to gape an inch and one-eighth. Crown dark rufous-brown, with occasionally some black on its centre; throat, sides of the head, and neck all round, black; bend of the wing and upper tail-coverts bright verdigris-blue; vent and under tail-coverts vermillion; a large white patch on the primaries; the back a fine glossy dark green, and under-parts lighter and more bluish green. Inhabits Assam, and the Malay peninsula.

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* Found also, together with *P. gigas*, in Arracan, from which locality one of several specimens before me is remarkable for the unusual size of its bill, which measures an inch and a quarter to forehead and an inch and a half to gape.

P. rodogaster, Hodgson. I can only describe this from a wretched bad specimen. Nearly allied to the last, and upper-parts much the same, but less bright; the second range of wing-coverts largely tipped with white: a white transverse band also on the throat, and lower-parts dull brown, mingled with green, though I can detect no appearance of moulting. Perhaps only the young of the preceding species. Nepâl.

P. gigas, Temminck. The Society possesses a Himalayan example of what appears to be the young of this species. Length about eight inches and a half, of wing four inches and three-eighths, and bill to gape an inch and three-sixteenths. Crown and lower ear-coverts dull brown, the former black-centred; lores, upper ear-coverts and beyond them, and another streak below the ear-coverts, black, occupying only the tips of the feathers on the latter; throat brown: rest of the upper-parts uniform bright dark blue; bases of the primaries white underneath, and under wing-coverts towards the axillaries the same: breast and belly light blue, with a slight shade of green on the former and of lilach on the latter, and all marked with imperfect black bands on each feather, becoming entire on the sides of the breast and flanks.*

P. coccinea, Eyton, *P. Z. S.* 1839, p. 104. A gorgeous species, scarcely yielding the palm of beauty to the lovely *P. cyanura:* wings short, rounded as in that bird, and more bowed or hollowed. Forehead and over the eyes black; the crown, occiput, and nape, intense carmine; rest of the upper-parts fine dark glistening purple, with a splendid shine; a longitudinal band on the wing approaching to smalt-blue; throat rufescent-brown; the fore-neck and breast purplish with red tips to the feathers, forming spots on the breast; belly, flanks, and lower tail-coverts, deep red: bill dusky-horn; and legs appear to have been plumbeous. Length seven inches or more, of wing three inches and a half, and tail an inch and a half; bill to gape an inch and one-eighth, and tarse an inch and five-eighths. Malay peninsula.

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* A specimen from Arracan is perhaps a female: the tail and its coverts are nearly as bright blue as in the Himalayan specimen, and there is an admixture of this colour on the interscapularies; but the rest of the upper-parts, from the red occiput, are dull greenish; and the blue of the under-parts is also weaker.

P. 190. The *Dimorpha albogularis*, Nobis, should not have been referred to that genus of Mr. Hodgson, and is identical with *Muscicapa superciliaris*, Jerdon, *Madr. Jl.* XI, 16. With my *D. superciliaris** preceding it, and which must now receive another specific appellation (*rubecula* would suit), it might form a particular sub-genus of *Muscicapidæ.* [This I have since termed *Muscicapula*, as introduced between brackets at p. 939 *ante*, where four species are referred to it, all of which inhabit the vicinity of Darjeeling.]

Same page. Indian Redstarts. To the various species of oriental Redstarts enumerated, may be added

Phœnicura leucoptera, Nobis. Size of *Ph. ruticilla*, and much resembling in plumage *Ph. Reevesii*, but smaller and the wings much shorter than in the latter species; it is also generally similar to *Ph. ruticilla*, but has no white on the forehead, which, with the crown, neck, and fore-part of the back, are ash-grey; the middle of the back is black, as are also the lores, ear-coverts, throat and breast; and the rest of the under-parts, with the rump and tail except the medial feathers of the latter, are bright ferruginous, the exterior web of the outermost tail-feather being marked with dusky; wings dusky, having a large white patch occupying the base of the secondaries and tertiaries; bill and feet black: according to season, the dorsal plumage is margined with brown edgings, the under-parts more slightly with greyish, and the wing-coverts with brown. The female I have not seen. Length about six inches, of wing two inches and three-quarters, and tail two inches and three-eighths; bill to gape five-eighths of an inch, and tarse three-quarters of an inch. Inhabits the Malay peninsula.

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* This, however, has been just received from Mr. Hodgson, who refers it to his *Dimorpha*, and he had previously sent a third species of the group. *Muscicapa superciliosa*, Gmelin, must not be confounded with either of these.

Ph. Reevesii, Gray. A description of this species may not be unacceptable. It much resembles *Ph. ruticilla* except in its larger size, in having a conspicuous white wing-patch, and less white upon the forehead. Length six inches and a half, of wing three inches and a quarter to three and three-eighths, and tail two inches and seven-eighths; bill to gape eleven-sixteenths of an inch, and tarse seven-eighths of an inch. The white wing-patch is confined to the exterior margin of the basal half of the secondaries, whereas in the preceding species it extends over both webs of each feather. The female is nearly similar to that of *Ph. atrata*, but may be distinguished by its more puffy general appearance, the greyer and non-rufescent hue of its under-parts, and especially by the different relative length of the primaries, having the first short one more developed and the second less so, the difference between these being only an inch, whereas in *Ph. atrata* it is an inch and a half or nearly so. Inhabits Nepâl and Assam.

P. 191. *Phylloscopus* (Boiè) *reguloides*; *Phyllopneuste reguloides*, Nobis, *passim*. This well marked species is not uncommon in the vicinity of Calcutta during the cool season.* A male measured four inches and seven-eighths in length, by seven inches and a quarter across, wing two inches and a half, and tail an inch and seven-eighths; a female gave respectively four inches and a half, six inches and seven-eighths, two and three-sixteenths, and an inch and three-quarters: but the generality are intermediate. Upper mandible dusky, the lower yellow; and legs yellowish-brown tinged with plumbeous. The mesial streak along the crown is broader and more conspicuous than in the next species, particularly on the occiput where it widens and contrasts with dusky on each side. It is readily distinguished from the next by its greater size, brighter colour, the absence of any whitish border to the tertiaries, and by most of the tail-feathers having their inner web margined with white; also by the plumbeous tinge of its legs. The young, as in *Ph. trochilus* and *Ph. rufus*, have their under-parts much brighter yellow than in the adults, during their first winter, and assume the mature dress early in the new year.

Ph. modestus; *Regulus modestus*, Gould: *R. inornatus*, Nobis, *passim*. This species, also, one of the European *Aves rarissimæ*, figured by

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* Perhaps it also breeds here, like the next; at least occasionally, as I obtained one so late as March 15th.

Mr. Gould from the only specimen then known, which was procured in Dalmatia, and of which a second individual has since been met with in England (vide *An. Nat. Hist.* II, 310), is by no means rare in the neighbourhood of Calcutta during the cool season and for some time afterwards. The mesial streak along the crown is not always well defined, and it often requires some trouble to make this appear distinctly in the preserved skins. Scarcely any trace of it exists in the old stuffed specimen which I styled *Regulus inornatus*; mistaking the species, as Mr. Gould had previously done, for a member of that genus: but I have since examined numerous fresh specimens, and do not in the least now hesitate in assigning it to *Phylloscopus* of Boiè, or the restricted *Sylvia* of various modern British Ornithologists. The average size of a male is four inches long, by six to six and a quarter across, wing two inches, and tail an inch and a half. Upper mandible dusky, the lower yellow except at tip; and legs rather pale brown, without any plumbeous tinge: irides dark. In the published admeasurements of the British-killed specimen, the length of the tail is given as but an inch and one-sixteenth, which is the only dimensional discrepancy noticeable from the specimens before me; but it is probable that this is a misprint for an inch and seven-sixteenths, the more especially as the wings are stated to reach within three-quarters of an inch of the end of the tail, which is the case with those obtained here. From the described brightness of the yellow parts, I am inclined to think that the specimen killed in Northumberland was a bird of the year (shot in September), whereas mine are all adults, having comparatively dull plumage (as in various other species of *Phylloscopus*, *Ph. sibilatrix* constituting an exception). The crown and upper-parts have, in the worn plumage, but a slight greenish cast, which increases on the scapularies, and particularly on the lower part of the back and rump, which are tolerably bright greenish; superciliary streak whitish, but very slightly tinged with yellow, and chiefly so anterior to the eye; adjoining this is an inferior dusky streak posterior to the eye, and on a level with that organ; mesial line of the crown generally faint, and often scarcely discernible: the markings on the wings are nearly those of a *Regulus*, presenting two whitish cross bars slightly tinged in general with greenish-yellow, the posterior broader and formed by the tips of the greater coverts, and the anterior by those of the lesser coverts; the tertiaries also are edged externally with whitish, and the primaries and secondaries more slightly bordered with the same, or, in some specimens, with olive-green; towards the posterior pale cross-band of the wing, however, is generally (not always) a well defined dark patch, caused by the secondaries being there unbordered, and which represents the blackish patch on the wing of *Regulus auricapillus:* the tail-feathers are not internally edged with white as in the preceding species; and the under-parts are dingy greyish-white, a little tinged with lemon-yellow, this colour appearing more conspicuously about the ear-coverts. The affinity which this species bears to the last will help to indicate its true systematic station, being strictly, as I may repeat, a *Phylloscopus,* and not a *Regulus.* Its habits, too, are solitary, and not gregarious as in the latter genus: and its song-note may be described as nearly similar to that of *Ph. sibilatrix,* but considerably weaker.*

Six other species of this genus occur in the vicinity of Calcutta. One I have already described as *Ph. fuscatus, (J. A. S.* XI, 113), and of this I have not hitherto obtained a second specimen.† It is at once distinguished by its comparatively large size, and prevalent brown colour. Three others of which I have also obtained as yet but one example of each, may be described as

Ph. nitidus, Nobis. Resembles *Ph. sibilatrix,* but is smaller in all its proportions, and has the entire under-parts, with the lower tail-coverts, tinged with yellow. Bill carneous-dusky, the lower mandible pale; and feet light brownish, tinged with yellow on the toes. This bird is of a much livelier green than any of the others, equally so with the European *Ph. sibilatrix,* and it is perhaps the species referred to *sibilatrix* in Royle's list: its under-parts are unsullied pale yellowish, brightest about the breast; and there is a pale bar crossing the wing, formed by the tips of the larger coverts of the secondaries. Length of a male four inches and three-quarters, by seven inches and a half across; wing two inches and five-eighths; tail two inches; bill to gape five-eighths of an inch; and tarse three-quarters of an inch.

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* March 7th. A nest of this species has been brought to me, with the pair of birds attached to it. It is an elegant structure, pendent from a twig of guava, and was placed at a considerable height from the ground: being of a domed form, with two apertures, one in front above the middle, having a distinct overhanging canopy, the other on one side behind, placed rather higher up; the upper-part is attached throughout its breadth to the twig. The body of the nest is constructed of a fine and soft vegetable fibre, like fine tow, closely interlaced to the thickness of half an inch; and this forms the internal lining: the domed part is much less substantial, though sufficiently strong behind, where the lower part is supported. Outside are affixed a number of bits of bark, spider-cocoons, and a variety of other substances, recalling to mind the external lining of the nest of the European Bottletit *(Mecistura caudata)*; which latter nest is fully double the size, but its single orifice is scarcely so large. There were no eggs in this nest, the outer lining of which is not completely finished. Both birds have their plumage very much worn, especially the male, the mesial coronal streak of which is only slightly indicated in part.—*E. B.*

† I have recently procured others, both of this and of *Ph. tristis.*

Ph. magnirostris, Nobis. Allied to *Ph. trochilus,* but distinguished by its larger size, its considerably larger bill, and more developed rictorial vibrissæ; also by the less brownish cast of its upper-parts, in lieu whereof is a slight wash of fuscous, by the cinerascent tinge of those below, and the darkish cinerascent hue of the crown, which contrasts with the more greenish colouring of the back: the wings, too, have the small first primary more developed, and the second less so, measuring an inch from the tip of one to that of the other, whereas in *Ph. trochilus* this measurement is an inch and a quarter. Length five inches and three-eighths, by eight inches across; of wing two inches and three-quarters; and tail two inches and one-eighth: bill to frontal feathers seven-sixteenths of an inch, and five-eighths of an inch to gape: tarse three-quarters of an inch. Bill dusky above, fleshy horn-colour at base of lower mandible; legs light plumbeous, having a yellowish tinge. The entire upper-parts are uniform dark olive-green, the medial larger coverts of the wings being tipped with albescent-greenish; there is a narrow but strongly marked pale yellowish streak over the eye, and the lower ear-coverts are partly of the same hue; throat and breast tinged with grey, mingled with faint yellowish, the rest of the under-parts paler and whitish on the middle of the belly. The colour of the legs will help to distinguish it from *Ph. trochilus.* The shikaree who shot it informed me that it sung prettily, and on my imitating the well remembered note of *Ph. trochilus,* he assured me that the song of this bird was quite different.

Ph. tristis, Nobis. Closely allied to *Ph. rufus,* but devoid of any greenish or yellowish tinge on the plumage, except on the fore-part of the wing underneath, and faintly margining the quills and tail externally; legs and claws black, or rather dull black (much darker than in *Ph. rufus),* except the under-surface of the toes which is yellow; bill also blackish, tinged with yellow at base of lower mandible, and the gape also yellow. Length four inches and a half, by six inches and a half across; of wing two inches and one-eighth; tail an inch and three-quarters; bill to gape half an inch; and tarse seven-sixteenths of an inch. General colour greyish-brown, beneath paler and albescent, a faint rufous tinge on the breast, and no trace of yellowish on the lower tail-coverts, nor elsewhere than as described.*

Ph. viridanus, Nobis; *Phyllopneuste rufa,* apud nos, XI, 191.† Allied to *Ph. rufus,* but of a weaker and much less brownish green above, and the under-parts much more albescent; the tarse shorter, but the length of wings and relative length of primaries the same: the colour of the tarse is also different, being of a greenish-leaden hue by no means dark. Length four inches and five-eighths to four and three-quarters, by seven inches and a quarter across; of wing two inches and three-eighths, and tail an inch and seven-eighths to two inches: bill above three-eighths of an inch from forehead, and nearly five-eighths from gape; tarse eleven-sixteenths of an inch.‡ Irides dusky. Bill dusky horn-colour above, the under mandible yellowish except towards the tip. Colour of the upper-parts a light dull olive-green, having a greenish cast when compared with those of *Ph. rufus;* of the under-parts greenish-albescent; and a narrow pale greenish streak over the eye: wings and tail light dusky, with greenish margins to the tertiariæ and tail-feathers, and a slight whitish bar on the wing formed by the tips of the larger coverts. The note of this bird is weak, and is expressible by the sound *tiss-yip,* frequently uttered, but never repeated a number of times in continuous succession like the much louder *tsih-tseh* of the

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* There is the faintest possible greenish tinge on the upper-parts of some that I have since procured, which colour is most developed on the margins of the secondaries, towards their base.

† *Ph. affinis,* of a catalogue of birds obtained in the vicinity of Calcutta, published in the 'Annals and Magazine of Natural History' for August and September, 1843.

‡ This species varies considerably in size. Of two recent examples before me, one measures five inches and one-eighth by seven and a half; wing two inches and a half; tail two inches; and tarse three-quarters of an inch: while the other is only four inches and a half by six and five-eighths; wing two inches and a quarter; tail an inch and three-quarters; and tarse eleven-sixteenths of an inch. I observe also that *Ph. modestus* varies a great deal in size. An unusually large one just obtained measures four inches and a half by seven inches across; wing two inches and a quarter, tail an inch and three-quarters; and tarse eleven-sixteenths of an inch

European species. It is very numerous in the vicinity of Calcutta during the hyemal months, and is likewise common in Nepâl.

Ph. lugubris, Nobis. Closely allied to the last, but averaging a rather larger size, with tarsi measuring fully three-quarters of an inch, instead of barely eleven-sixteenths of an inch, and they are likewise slightly darker than in the other. The whole upper-parts are also of a darker shade, particularly the head which is much darker and tinged with dusky; throat, breast, and flanks, dashed with ashy-grey, having traces of yellowish, and altogether this species is conspicuously of a darker and more fuscous shade than the preceding one. Its note again is different, and much louder than that of the last. Also common near Calcutta during the cold season; and a Madras specimen of the young has been forwarded by Mr. Jerdon. The young or rather second plumage of this species is much yellower than the adults, as in the corresponding garb of *Ph. trochilus* and *Ph. rufus.**

Culicipeta, Nobis, *n. g.* General structure of *Phylloscopus*, but having a narrow Flycatcher's bill and armature of rictus, the ridge of the upper mandible angulated, and the breadth of the bill evenly attenuating.

C. *Burkii; Sylvia Burkii*, Burton, *P. Z. S.* 1835, p. 153; *Muscicapa bilineata*, Lesson, *Rev. Zool. par la Soc. Cuv.* 1839, p. 104. Length four inches and seven-eighths, by six inches and a half in alar expanse;

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* Having lately received British specimens of *Ph. trochilus* and *Ph. rufus*, I have rewritten some of the above descriptions; and a long while subsequently to my first describing most of the species noticed in the present report, a packet of skins of this genus was received from Mr Hodgson, amongst which I think I correctly recognised the *Ph. trochilus* and *Ph. rufus*, but *Ph. sibilatrix* was not among them, which species, together with the two preceding British kinds, are mentioned in the catalogue of Dr. Royle's birds procured at Saharunpore and its vicinity. Mr. Hodgson sent seven species of *Phylloscopus*, including the *modestus*, to which are to be added my *reguloides*, *nitidus*, *magnirostris*, *lugubris*, *tristis*, and *fuscatus*; making thirteen Indian species, and Dr. Royle's *sibilatrix*, if different from my *nitidus*, should constitute a fourteenth. Mr. H. also sent the European *Phyllopneuste hippolais* (*Sylvia hippolais* of Temminck, or a closely allied species), and the *Culicipeta Burkii* above described. Four of these species of *Phylloscopus* have the central coronal mark, and the specimen of *modestus* sent was in new plumage, with a more strongly marked mesial coronal streak than usual, thus resembling the figure in Gould's 'Birds of Europe.' All were temporarily returned, so that I have not them now by me for reference.

In a paper since forwarded by Mr. Hodgson, the species with central coronal streak are separated from the others; but I much prefer to arrange them as slight divisions merely of the same genus.

of closed wing two inches and a quarter, and tail an inch and three-quarters; bill to frontal feathers three-eighths of an inch; and tarse eleven-sixteenths of an inch. General colour bright yellowish olive-green above, and a full siskin-yellow underneath; over each eye a broad black streak reaching to the occiput, leaving the middle of the head greenish, more or less flanked with ashy-grey; tail dusky, its middle feathers flanked with the hue of the back, and the inner web of the outermost tail-feather white nearly throughout, as also the terminal half of that of the next: some have a dull yellow cross-band on the wing, formed by the tips of the coverts of the secondaries, which in others is obsolete. Irides dark. Bill dusky above; underneath, with the legs, pale brownish yellow, more or less bright, and darker on toes. This pretty little bird is not uncommon in the neighbourhood of Calcutta during the cold season.

Same page. Genus *Cinnyris* [or rather *Nectarinia*, which Mr. G. R. Gray, and since Sir W. Jardine, have shewn to be the prior appellation. The volume on Sun-birds in the 'Naturalist's Library,' by the latter gentleman, has just reached me, and a perusal of it has led me to rewrite the remarks I had to offer on this group*]. Of the elegant section with graduated tails, whereof the two middle feathers are prolonged considerably beyond the rest, the following Indian species occur.

1. *N. Goalpariensis*, Jardine; *Goalpara Creeper*, Latham, *Gen. Hist.* IV, p. 221, pl. XXIV; *Certhia Goalpariensis*, Royle, *Ill. Him. Bot.* &c.: *Cinnyris Vigorsii*, Sykes, *P. Z. S.* 1832, p. 99: *N. Seheriæ (?)*, Tickell, *J. A. S.* II, 577: *C. miles*, Hodgson, *Ind. Rev.* 1837, p. 273: erroneously, it would appear, assigned by me on former occasions to *N. mysticalis*, Tem., vide XI, 107. A gorgeous little bird, having the throat, fore-neck and breast, intensely brilliant carmine, with a glossy violet stripe on each side, from the corner of the lower mandible to more than half-way down the neck: ear-coverts, sides and hind-part of the neck, back, scapularies, and smaller wing-coverts, a darker sanguineous: forehead and crown of the head, together with the upper tail-coverts, dark shining metallic green, more or less glossed with purple: rump bright yellow: middle tail-feathers externally purple towards the base and at the tip, the rest shining bottle-

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* In a letter just received from the author, *N. calcostetha* of his synopsis of the *Nectarinidæ* is identified with *N insignis.*

green; margins of the other tail-feathers similar, to a greater or less extent: the rest of the wings, with the occiput, dull brownish green; and below the breast, the same but lighter: bill horn-colour at base, the terminal half of the upper mandible, and nearly all the lower, paler; legs brown. "The female and young," observes Mr. Hodgson, "wear a sombre russet robe instead of the flaming scarlet of the male; their cap is not burnished, nor have they the splendid moustache; and the central rectrices are neither pointed nor prolonged beyond the series of the rest.* Length of the male six inches, by six and a half in extent, and a quarter oz. in weight." Wing from bend two inches and three-eighths, and middle tail-feathers three inches: bill from forehead three-quarters of an inch, in a straight line; and tarse half an inch.

This splendid bird appears to be common in the Tenasserim provinces, and also in Nepâl, being much rarer, or perhaps local, in central and southern India. Col. Sykes, in his catalogue of the birds of the Deccan, remarks, that "it inhabits only the lofty trees of the dense woods of the ghats." Mr. Jerdon has not been successful in meeting with it; but Lieut. Tickell procured a single one "near Seheria in Borabhùm, flitting about the low willow-bushes in the dried bed of a stream. — It has no song, but a shrill chirp." The description given by that gentleman entirely accords with specimens before me, except that he assigns four inches as the length, which is probably a misprint for six inches. Dr. Royle figures it as one of several tropical birds that visit northern India and the Himalaya during the rains, though at least one of its companions in the same plate is strictly Sub-Himalayan: neither his coloured figure, however, nor that in the 'Naturalist's Library,' makes any approach to the brilliancy of nature.

1. a. *N. Lathami*, Jardine, *Nat. Lib.*, *Orn.*, Vol. XIV, 233-68. "We possess a specimen of a Sun-bird from some part of Continental

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* Evidently the *C. concolor* of Col. Sykes's catalogue, defined as "*C. viridi-olivacea, alis caudaque saturatioribus, corpore subtùs pallidiore. Longitudo corporis*, 4 *unc.; cauda* 1. *Irides intensè rufo-brunneæ*:" to which is added — "As four specimens obtained by Col. Sykes were all females, and as they were met with in the same locality as *C. Vigorsii*, *C. concolor* may be the female of that splendid species; but the difference in the size, form, and aspect of the bird, independently of colour, is opposed to this" (certainly not): "they were never seen together. This bird has the outline of *C. mahrattensis*. The specific appellation *concolor* is given provisionally."—*P. Z. S.* 1832, p. 99.

India," writes Sir W. Jardine, "closely allied to *N. Goalpariensis,* and also to the *Certhia Siparaja* of Sir Stamford Raffles's catalogue. From the Goalpara Sun-bird it differs in a slight general modification of the tints of the plumage, in the yellow of the rump being much deeper, and in the coronal patch, upper tail-coverts, and tail, being steel-blue instead of metallic green, and in the tail being shorter and more regularly graduated. Sir Stamford's bird is from Sumatra; no mention is made of the yellow rump, while, in the catalogue appended to that gentleman's memoirs, *N. mysticalis,* Tem., from Java, is quoted. A comparison of the birds may serve to distinguish them. The entire length is four inches and two-fifths; that of the bill to the forehead three-fifths of an inch. [*N. Seheriæ?* Tickell.] Above the forehead to the line of the eyes is steel-blue, with a play of colour; the upper tail-coverts and edges of the tail-feathers, except the outer, are of the same tint, and the tail itself, which is nearly black, has a very strong gloss of bluish-purple; the back and sides of the neck, cheeks, back, and lesser wing-coverts, are rich brownish-red. the lower part of the back and rump are very deep gamboge-yellow, almost Dutch orange, and following the red of the back we have the same lengthened plumes we saw in the last, of a dark greyish oil-green, and which can completely cover the yellow patch; the wings are umbre-brown, feathers edged with a paler tint and oil-green. Underneath, we have the maxillary stripes running upon the sides of the neck, inside-half of the feathers black, the exterior rich violet, the chin, fore-part of the neck and breast, bright scarlet-red; the remaining under-parts dull greyish oil-green. Bill umbre-brown, slightly paler on the maxilla.

"As stated, we do not know the locality of the specimen we have described, and in the collection of the Zoological Society there is one similar, and bearing out the distinctions from *N. Goalpariensis* we have pointed out, but the locality of which is also unknown."

On comparison of this description with several specimens of *N. Goalpariensis,* I am constrained to doubt very much the distinctness of *N. Lathami,* and would suggest that it is perhaps a female *Goalpariensis* in masculine att*i*re. There is indeed generally a greater or less admixture of steel-blue, with the glossy bottle-green of the cap and sometimes the upper tail-coverts of the latter, and still more upon the tail itself, as noticed in my description.

2. *N. ignicauda; Cinnyris ignicauda*, Hodgson, *Ind. Rev.* 1837, p. 273: *C. rubricaudata*, Nobis, mentioned in *J. A. S.* XI, 192: *N. phœnicura*, Jardine, *Nat. Libr.* Mr. Hodgson thus describes this species, in its post-nuptial garb, certain species of Sun-birds being well known to assume a dull-coloured plumage after breeding. "Above, olive-green; beneath, together with the rump, yellow: chin, cheeks, and front of the neck, blue-grey with a greenish wash; breast dashed with fiery-red; caudal plumes and their upper coverts intense igneous-red; remiges and rectrices, internally, dusky-brown: seven inches long, whereof the tail is three inches and three-quarters, its two central plumes passing the rest by an inch and three-quarters: weight half an oz., or considerably larger than most of the others. The female is smaller, and has her caudal plumes of the same hue with the body above, and merely fringed with fiery-red; but the coverts are igneous, and the breast is touched with fire, as in the male: the tail wants the prolonged plumes of the male, as in all the long-tailed species.

"*C. ignicauda* is distinguished, specifically, by the comparative straightness of its bill, which is, indeed, distinctly curved, but less so than in the allied species; it scarcely reaches the average excess of the genus, or one-third more than the head."

A male and female have recently been sent by Mr. Hodgson, the medial tail-feathers of the former being no less than five inches in length. It otherwise agrees with the above description, except that the olive-green plumage of the upper-parts is not completely put forth, several brilliant red old feathers being intermixed with it. I have now no doubt of its identity with my *C. rubricaudata*, of which I took the following description from a Darjeeling specimen. Upper-parts as in *N. Gouldii*, except that the tail-coverts are scarlet, and the long middle tail-feathers crimson, the crown also being violet unmixed with lake-purple; and under-plumage resembling that of *N. Nipalensis*, but having more reddish flame-colour, and less diffused on the centre of the breast, while the throat and fore-neck have no greenish gloss, but are intensely rich dark shining purple along the middle, and brilliant violet laterally. No painting could express the splendour of this magnificent species. The back is of a burnished and richer crimson than that of *N. Goalpariensis*, or of *N. Gouldii*, from both of which this species differs in possessing none on the smaller coverts of the wings, which, with the scapularies, are glossless green, as in *N. Nipalensis*; from the latter it differs, and resembles *N. Gouldii*, in the crimson of the back extending up the hind-neck to the occiput; there is a yellow band, as in most of the allied species, across the rump; the lores and ear-coverts are glossless black, mixed with green on the latter; and the greater wing-feathers, and their larger coverts, dusky, edged with greenish, passing into rufous on one of the secondaries on each side; the outer tail-feathers have their inner webs dusky, the outer red, and tips a little greenish: under-parts bright yellow, passing into greenish on the flanks, vent, and lower tail-coverts, and deeply tinged with gorgeous flame-colour on the centre of the breast. Bill black, and but very little curved; legs brown. Length six inches and one-eighth, of which the bill measures three-quarters of an inch to forehead, and middle tail-feathers three inches and one-eighth;* the latter do not taper at the end: wing two inches and a quarter; and tarse nine-sixteenths of an inch. On the neck are two or three unmoulted feathers, which are greenish like the scapularies.

Mr. Hodgson's female is wholly olive-green, paler and yellowish beneath; upper tail-coverts and central pectoral spot igneous-red; and tail slightly tinged with the same, its form graduated, but the middle pair of feathers scarcely passing the next.

Sir W. Jardine's *N. phœnicura*, from Sylhet, would seem to be identical, except that the chin and centre of the throat and neck are described to be deep velvet-black, with two broad maxillary stripes steel-blue with violet reflections: unfortunately, I have not a specimen wherewith to compare his description.† What this naturalist, however, considers to be the female, is evidently the male in corresponding plumage to that described by Mr. Hodgson.‡ It would appear to be a rare species in Nepâl, and is also rare in the vicinity of Darjeeling.

3. *N. labecula; C. labecula*, McClelland and Horsfield. *P. Z. S.* 1839, p. 167. "*Punicea, gula, pectoreque nitidissimis; capite, plumis*

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* These middle tail-feathers could not have been full grown: *vide* in following note.

† In a beautiful collection of Darjeeling specimens just arrived, from which I am kindly permitted to make a selection, there are three beautiful males of this species, which quite agree with my description, and are also evidently identical with Sir W. Jardine's *N. phœnicura*. In all of these the middle tail-feathers are growing.

‡ I perceive that this was subsequently remarked by Sir William in his Synopsis; or at least that he considered it to be a young male.

scapularibus, caudaque metallicè aureo-viridibus; alis fuscis viridi nitentibus; subtùs cana. Body three inches, tail two inches long:" from Assam. I have seen a drawing of this bird, which pertains to the present group, and is obviously distinct from all the others here described.

4. *N. Nipalensis; Cin. Nipalensis,* Hodgson, *Ind. Rev.* 1837, p. 273. Nearly allied to *N. Gouldii* figured in the 'Century of Himalayan Birds,' but larger, with the dark scale-like feathers of the crown continued down the back of the neck, and glossed with greenish, sometimes a little bronzed, instead of violet; the same remark applies to the tail and its coverts, and to the throat; and there is also no red on the smaller wing-coverts, while that of the back is darker and quite glossless: middle of the breast tinged with flame-colour, of which there is seldom more than a faint trace in *N. Gouldii,* and often not any, while *N. ignicauda* has much more of it. The present species is remarkable for the comparative length and looseness of the feathers of its hind-neck, which have broad scale-like tips that, together with the crown, occiput, throat, upper tail-coverts, long and tapering middle pair of tail-feathers, and the outer margins of the other tail-feathers, are brilliantly glossy dark steel-green; lores and ear-coverts black, the latter glossed with purple: scapularies and margins of the wing-feathers olive-green, as in *N. ignicauda,* which the breast and under-parts resemble except in having less flame-colour, which is more diffused; yellow of the rump brighter than in most of the others: bill black, and legs dusky-brown. Length five inches and three-quarters, of which the middle tail-feathers measure two inches and five-eighths, and the bill from forehead three-quarters of an inch; wing two inches and one-eighth; and tarse nearly five-eighths of an inch. The female is rather smaller, and uniform olive-green above, faintly tinged with rufous; below paler and yellower: tail shorter, with its middle pair of feathers scarcely elongated beyond the rest. "The young males," according to Mr. Hodgson, "are earthy-brown on all the glossed parts of the mature males. So also in [*N. Goalpariensis*], and (as I suspect,) in all the gorgeous species." Habitat Nepâl and Sikim: very abundant about Darjeeling.

5. *N. Gouldii; C. Gouldii,* Vigors, *P. Z. S.* 1837, p. 44; Gould's *Century,* pl. LVI. Rather smaller than any of the preceding, with

the sides and hind-part of the neck, the back, scapularies, and smaller wing-coverts, deep crimson, as in *N. Goalpariensis;* crown, ear-coverts, and throat, rich glossy violet, or purple, according to the light; a brilliant shoulder-tuft of the same; and the upper tail-coverts, lengthened middle pair of tail-feathers, and outer margins of the other tail-feathers towards their base, also similar; rest of the tail dusky, the three outermost feathers with albescent tips, as is likewise the case in *N. Nipalensis,* and with the next species; yellow band over the rump as usual; wings beyond the smaller coverts dusky, margined with olive-green; the breast and belly bright yellow, with sometimes a faint tinge of flame-colour about the middle; bill blackish, and legs dark brown. Length five inches and a half, of which the bill to forehead measures nine-sixteenths of an inch, and the long tail-feathers three inches; wing from bend two inches and one-eighth; and tarse half an inch. The only female I have seen was deficient in the tail, and was everywhere dull olive-green, paler on the under-parts, deeper and slightly aureous on the back, with a somewhat reddish cast on the margins of the primaries and secondaries. This beautiful species is rare at Darjeeling, where it is much sought after by collectors, who have currently styled it the "Beauty of the Hills," a name by which it will be recognised by many.

6. *N. Horsfieldi; Cin. Horsfieldi,* Nobis, mentioned in *J. A. S.* XI, 107. Upper-parts very similar to those of *N. Nipalensis,* only without the red, a slight trace of which, however, appears on the lower part of the sides of the neck; the scale-like nuchal feathers, also, are not so broadly glossed as in *N. Nipalensis,* and have more of a purplish shine; the under-parts, too, differ only in having merely the slightest trace of flame-colour, as in some specimens of *N. Gouldii,* and which as in that species may often be wanting altogether: the whole back, scapularies, and margins of the wing-feathers, are golden olive-green, and the yellow on the rump (as in *N. Nipalensis)* is very broad and conspicuous; the ear-coverts are glossed with purple, and the lores and sides of the neck are unglossed black: bill dusky, and legs brown. Length five inches and a half, the bill to forehead measuring three-quarters of an inch, and the long middle tail-feathers two inches and a half; wing from bend two inches and one-eighth; and tarse exceeding half an inch. Female unknown. The only specimen

observed was contained in a collection partly from the Himalaya and partly Malayan.*

7. *N. saturata; Cin. saturata*, Hodgson, *Ind. Rev.* 1837, p. 273: *C. Assamensis*, McClelland and Horsfield, P. *Z. S.* 1839, p. 167: *N. Hodgsonis*, Jardine, *Nat. Libr.* Size of *N. Gouldii*, but having a considerably larger bill, and predominating deep black plumage, which colour extends over the throat, breast, and fore-part of the belly, the lores, ear-coverts, and sides of the neck, and on the wings and rump, upon which last there appears to be more or less trace of the ordinary yellow band in different specimens, but never much; scapularies and interscapularies dark sanguineous; crown, occiput, and back of the neck, brilliant steel-blue approaching to violet, and a streak of the same down each side of the front of the neck, commencing at the corner of the lower mandible and gradually widening; upper tail-coverts, lengthened middle tail-feathers, and margin of the next pair of tail-feathers towards the base, glossy steel-blue, like the head; flanks, hind-part of the belly, and lower tail-coverts, dull olive-green; rest of the tail black, as is also the bill, and feet brown; the greater wing-feathers are margined with dark olive. Length six inches, of which the bill to forehead rather exceeds three-quarters of an inch, and the tapering middle tail-feathers measure three inches and a quarter; wing from bend an inch and one-eighth, and tarse posteriorly half an inch. Extent, according to Mr. Hodgson, seven inches, and weight a quarter of an ounce. This species inhabits Nepâl, the vicinity of Darjeeling, and Assam.

Upon the various allied long-tailed *Nectariniæ* inhabiting the Indian Archipelago, I have no information to contribute. Of those with even or but slightly rounded tails, there appear to be only two species in Bengal, which are pretty generally distributed throughout India proper.

N. Zeylonica; Certhia Zeylonica, Linnæus: *Cin. sola*, apud Jerdon, and of my former reports: *C. lepida (?)*, apud Sykes.† Very abundant in the neighbourhood of Calcutta throughout the year, the male retaining its bright colours at all seasons. The female is dull-green above, with a slight rufous tinge, and cinnamon-coloured edgings to the greater wing-feathers; tail dusky-black, and under-parts less bright yellow than in the male, having the throat and fore-neck albescent. The young, in nestling garb, resemble the female, but have the throat and flanks as yellow as the breast, a streak over the eye more distinct and yellow, and dark hazel irides. This appears also to be the commonest species of the genus in peninsular India, but I have never seen it in collections from the Himalaya, nor is it included among the Nepalese species by Mr. Hodgson. It has a weak shrill chant, delivered in the same key as the song of the British *Accentor modularis ;* and frequently emits a low weak chirp, that re-cals to mind the analogous note of a *Regulus*, or of *Certhia familiaris.* The natives here take them with bird-lime, and after plucking out the wing-primaries to prevent their fluttering, tie them to a stick, and carry rows of them thus about for sale. These may be kept alive for several days on merely sugar and water, and I have heard one sing that had had no other diet for some days; but raspberry or other fruit-jam is a better kind of food on which to keep these nectar-feeding birds. The members of the present genus, however, by no means confine themselves to a regimen of the kind, and I have taken so large a spider from the stomach of C. *Mahrattensis*, as to have wondered how it could have been swallowed. Mr. Hodgson, indeed, has even declared that he " entirely doubts their alleged nectarinean diet" (*Ind. Rev.* I, 273); but this is going rather too far, as the facts already stated tend sufficiently to shew.

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* The donor of that collection has just informed me that the specimen in question formed part of a consignment which he received from the hills, *i. e.* the Himalaya. Can it be a variety only of *N. Nipalensis*?

† *C. lepida* of Latham is evidently the *Anthreptes Javanica* of recent authors; while *C. lepida* of Sparrman is regarded in Griffith's work as the female of *N. sperata*.

According to Mr. Walter Elliot, the present species " builds a hanging nest with an entrance near the top, opening downwards"; and such is the form of a beautiful fabric before me, which I am assured is the production of this bird: it is attached, nearly throughout its length, to a small thorny twig, and is of an elongated pear-shape, composed chiefly of soft vegetable fibres very densely and neatly interwoven; on the outside are some coarser strips of grass-leaves, scalings of bark, &c., but the substance and internal lining are constructed of the softest fibres only, which are reflected over the lower portion of the entrance so as to fasten down its rim, imparting thus a neatness of finish to this part of the structure ; above the floor of the entrance is an overhanging roof or canopy, formed by the lining of the upper third or more of the nest being made to project semi-circularly over the orifice, and then finished externally like the rest with coarser material, and some bits of leaves and the like to disguise the nature of the fabric.

N. minima; Cin. minima, Sykes, *P. Z. S.*, 1832, p. 98. A diminutive species, allied to the last, from the upland forest-jungles of southern India. The Society is indebted for a specimen to Mr. Jerdon.

N. Mahrattensis; Certhia Mahrattensis, Latham: *Cin. orientalis*, Franklin: *C. epauletta*, Hodgson, *Ind. Rev.* I, 272: *C. currucaria*, apud Sykes, post-nuptial plumage. Visits the neighbourhood of Calcutta only in the cold season, when it is not uncommon. On its arrival, both sexes are clad in the plumage referred to *N. currucaria* by Sykes; and before they leave, all have more or less completely assumed their nuptial dress, which also is alike in both sexes. In Nepâl it is probably a summer visitant only; and it extends westward to the Indus, and southward to Ceylon, but I have never seen it from the eastern side of the Bay of Bengal.*

N. lotenia; Certhia lotenia, Lin.: *C. polita*, Latham, Jerdon: *C. purpurata*, Vieillot, Shaw. Allied to the last, but distinguished by its superior size, its much larger and more curved bill, and brown underparts from the breast, also by the admixture of green in its glosses.

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* I have lately procured the young of this species, which is dark olive-green above, and tolerably bright yellow on the under-parts; wings dusky, with brownish margins to the tertials; and tail black, its exterior feathers tipped with whitish, and the outermost pair largely so, extending far up their outer webs. To this plumage would succeed the purple breeding dress; and the *Cin. strigula*, Hodgson (*Ind. Rev.* 1837, p. 272), would seem to be founded on a specimen which had began to throw out the purple feathers as "a long central stripe from chin to breast," just as is shewn by another specimen before me, which however is moulting into the purple garb from the non-breeding livery of the adult, this last being, I apprehend, Mr. Hodgson's female *strigula*. The following is that naturalist's description. "Above dark olive-green, below bright yellow, shoulders and a long central stripe from chin to breast, brilliant deep blue; alar and caudal plumes dusky or black, the latter tipped and margined laterally in the extremes, with white; a paler line over the eyes, and darker one through them: bill dusky; legs black. The female is earthy-brown above, and greenish-yellow below. She is without gular stripe or shoulder-spot. Size and characters of [*N. Mahrattensis*]."

Since writing the above, I have found a skin referred by Mr. Hodgson to the female of his *strigula*, but which has no trace of "greenish-yellow" on the under-parts, these being uniform dull albescent: so far as I can make out, from the condition of the specimen, I should judge it to be an old female *Mahrattensis* in the non-breeding plumage.

Alleged breeding plumage of the female as unlike that of the male as in *N. Zeylonica*, wherein it would differ remarkably from *N. Mahrattensis.* Inhabits Southern India and Ceylon.

N. jugularis, Vieillot, apud Jardine; or a closely allied species, perhaps distinguishable upon actual comparison from the Philippine bird cited. Length about four inches and one-eighth, of wing two inches and one-sixteenth, and tail an inch and one-eighth; bill to forehead five-eighths of an inch, and tarse under half an inch. Colour of the upper-parts dull olive-green, brightening a little on the rump: beneath moderately bright king's-yellow; and the axillary tuft intense yellow with flame-colour anteriorly: throat and front of the neck very dark glossy purple, margined laterally and at the gorget with bright steel-purple, below which is a trace of a narrow cross-band of dark red. Bill and feet dusky. Female similar, except in wanting the axillary tuft, and having the throat and fore-neck yellow, like the rest of the lower-parts; but one of three specimens (probably an old female, rather than a male in *undress,)* has the middle of the throat and front of the neck dusky, flanked with yellow. All have the tail blackish, and its outermost feathers tipped with purer white than is usual in this genus, this successively decreasing in quantity on the two or three next. Common in the Tenasserim provinces.

Certain species with straighter and less prolonged bills constitute the division *Anthreptes*, Swainson. *Nect. Javanica*, Horsfield, is cited as an example, and it is from this species that the diagnosis is evidently drawn up; for in the Tenasserim and Malayan species formerly referred by me to *rectirostris*, Auct., but which would now appear to be different, the bill is still shorter and less curved, the upper mandible is at least as high as broad at base, where its upper ridge is continued sharp to the forehead. I will designate it

*Anthr. phœnicotis.** Length four inches and a quarter, of which the bill to forehead measures half an inch, and the tail an inch and three-quarters; wing two inches and one-eighth; and tarse eleven-sixteenths of an inch. Upper parts a glossy bronzed green, including the crown and wing-coverts; upper tail-coverts glossy green without the bronzing; rest of the wings and tail dusky, the feathers of the latter margined with shining green, and the secondaries and tertiaries slightly with faint purple: throat, fore-neck, and breast, a light ferruginous; the rest of the under-parts bright yellow: ear-coverts amethystine, passing into ruby-red on the sides of the neck, and separated from the hue of the throat by a stripe of glossy purple; bill dull black, and legs appear to have been greenish. The female has the upper-parts glossless olive-green with a tinge of grey; breast as in the male, but scarcely so bright; and under-parts dull greenish-yellow; alars and caudals margined with aureous-green. The young resemble the female, except in the more downy texture of their feathers, and the chestnut colour of the fore-neck and breast is reduced to a slight tinge. Inhabits the Tenasserim provinces, and appears to be common at Singapore.

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* I see that Temminck has already applied to it the identical specific name, terming it *Nectarinia phœnicotis*, *p. c.* 108, f. 1, and 338, f. 2, apud *Dict. Class.*

In the same range of territory *Anthr. Javanica** abounds; and in the southern portion of it occurs a species which much approaches in its plumage the *Arachnotheræ.* I shall term it

Anthr. nuchalis; the female indicated, but not described, as *A. macularia, J. A. S.* XI, 107. Length about five inches and a half, of wing two inches and five-eighths, and tail an inch and seven-eighths; bill to frontal feathers above three-quarters of an inch, and but little curved; tarse five-eighths of an inch. General colour of the upper-parts a rich dark olive-green, the tail dusky, its outer feathers successively more broadly margined with whitish, chiefly on their inner webs; the base of the hind-neck, and the upper tail-coverts, (of the male only,) brilliant steel-blue: under-parts streaky, each feather broadly marked with dark olive-green along the middle, and laterally margined with pale sulphur-yellow, brightest on the belly: bill dusky horn-colour; and legs leaden-brown. Singapore.

The two species assigned to *Anthreptes* in Mr. Eyton's list of a collection from the Malay peninsula, published in *P. Z. S.* 1839, p. 105, would seem, from the length of bill, as well as from their size, to be rather referrible to *Arachnothera.* This group consists of Sun-birds of comparatively large size and sombre greenish colouring, with a very long and but moderately curved bill, and nostrils (apparently) closable at will by the impending membrane. They appear, like the last, to be peculiar to tropical Asia and its Archipelago, and are regarded by Mr. Hodgson as the most highly typical form of the family. Such are—

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* *Certhia lepida* of Latham.

1. *A. magna ; Cin. magna*, Hodgson, *Ind. Rev.* 1837, p. 272 : *A. inornata (?)*, Tem., apud Horsfield, *P. Z. S.* 1839, p. 167*. "Length eight inches by eleven and a quarter, and weight an inch and three-quarters": bill to forehead an inch and five-eighths; wing three inches and a half; tail two inches and one-eighth; and tarse above three-quarters of an inch. Upper-parts greenish-yellow, each feather having a central black streak; lower-parts yellowish-white, similarly striated: tail with a subterminal black band, and an albescent spot beyond this on the inner web of its outer feathers: "bill dusky; legs, feet, and claws, bright orange", the hind-toe very large and strong. Inhabits Nepal and Assam.

2. *A. (?) flavigastra ; Anthreptes flavigaster*, Eyton, *P. Z. S.* 1839, p. 105. Size of last, and length of bill the same. "*Capite, dorso, pectore colloque cinereo-viridibus ; corpore subtùs flavo ; alis, caudâ tectricibusque alarum, brunneis ; rostri mandibulâ superiore atrâ, inferiore flavâ ; pedibus brunneis.*" Inhabits the Malay peninsula, where termed *Chichap Rimba.*

3. *A. (?) modesta ; Anthreptes modesta*, Eyton, *P. Z. S.* 1839, p. 105. Length six inches and a half, of which the bill measures an inch and a quarter; tarse five-eighths of an inch. "*Vertice, dorso, alis, caudâque viridi-olivaceis hâc singulis pennis mediis brunneis, illâ præpillatâ atro ; corpore subtùs viridi, singulis pennis in mediis obscuris ; rostro pedibusque brunneis.*" Inhabits the Malay peninsula, where denominated *Chichap Nio.*

4. *A. chrysogenys*, Tem. *pl. col.* 388, fig. 1; *Certhia longirostra*, Raffles, *Lin. Trans.* XIII, 299, but not of Latham and others. Length about six inches and three-quarters, of which the bill measures an inch and three-eighths to forehead, and the tail two inches; wing two inches and three-eighths, and tarse eleven-sixteenths of an inch. Colour of the upper-parts dull olive-green, the alars and caudals margined with yellowish: under-parts lighter, slightly washed with yellow, and very faintly striated; belly and under tail-coverts moderately bright yellow; the tibial feathers brown: cheeks beneath the eye naked of feathers; a bright yellow tuft commencing at the gape, and orbital mark of the same above the eye: bill dusky, the edges of the upper mandible

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* At least Dr. McClelland's drawing of what I have reason to suspect is the identical specimen referred to, represents the present species.

yellowish, as appear also to be the legs and toes. Inhabits the Malay countries.*

5. *A. inornata,* Tem., *pl. col.* 84. ; *Cin. affinis,* Horsfield, *Lin. Trans.* XIII, 166 ; *C. longirostris,* Jerdon, *Supplement to Catalogue.* Length five inches and three-quarters, of which the bill to forehead measures sometimes an inch and a half, and tail about the same ; wing two inches and a half to two and five-eighths, and tarse five-eighths of an inch. Colour of the upper-parts olive-green more or less flavescent; the crown darker, with scale-like feathers, merely green-edged : under-parts dull greenish-albescent, passing into brighter pale yellow on the belly : tail-feathers slightly tipped with whitish, chiefly on their inner-webs, forming a spot which is more distinct to the outermost. Bill dusky above, the lower mandible whitish underneath ; and legs plumbeous. Inhabits the Malay countries, spreading northward to Arracan ; and Mr. Jerdon has obtained one specimen of it in the Mysore district, bordering the Neilgherries.

6. *A. longirostra,* Tem. ; *Certhia longirostra,* Lath., *Ind. Orn.* 299 ; *Cin. longirostra,* Horsfield : figured in Griffith's Edition of the *Régne Animal,* VII, 392. " Ashen-olive above ; alar quills brown, edged with olive ; caudal blackish, white-tipped ; throat and front of neck white ; rest [of under-parts] clear yellow. Java."

7. *A. latirostris,* Nobis. Length six inches, or nearly so ; of wing two inches and seven-eighths ; and middle tail-feathers an inch and three-quarters, the outermost above three-eighths of an inch less : bill to forehead an inch and a quarter ; being shorter and much broader than in *A. inornata,* but tapering to its extremity, and also more curved : tarse five-eighths of an inch. Upper-parts bright yellowish olive-green, the lower pale ashy-green, and obscurely striated ; lower tail-coverts tipped with whitish : tail more graduated than usual in this group, with a subterminal dusky band, all but the medial two pairs of tail-feathers having a well-defined pure white spot near the extremity of the outer web, successively larger to the outermost. Bill dusky-brown above, the lower mandible pale ; and feet yellowish. Inhabits the vicinity of Singapore.

To conclude this notice of Indian *Nectarinidæ,* there remains to be considered the genus *Dicæum.* Of this there are two Indian species remarkable for the absence of vivid colouring.

D. concolor, Jerdon, *Madr. Jl.* XI, 227. Length about four inches, of wing two inches and one-tenth, and tail an inch and one-eighth; bill to forehead seven-sixteenths of an inch, and tarse half an inch. Above, brownish-olive; beneath, dull greenish-white: bill and legs brownish-cinereous: sexes alike. Frequents the highest branches of lofty trees on the Malabar range and Neilgherries: and

D. Tickelliæ, Nobis; *Nectarinia minima,* Tickell, *J. A. S.* II, 577. Length three inches to three and one-eighth, by six inches across; of wing an inch and three-quarters to one and seven-eighths, and tail seven-eighths of an inch; bill to forehead three-eighths of an inch; and tarse seven-sixteenths of an inch. Above ashy-olive, paler beneath; wings and tail darker: bill pale flesh-coloured, with dusky tip; and legs leaden-brown; irides dark: sexes alike. Habits similar to the last, emitting frequently a loud chirping for its size. This bird is common about Calcutta,—Mr. Hodgson has sent it from Nepâl, — and Captain Tickell mentions it to be common in saul-jungle in Borabhúm and Dholbúm.*

Among the gay-coloured species, there is at least one in Bengal; viz.

D. erythronotum, Auct. Not rare in the vicinity of Calcutta, and occurs in Assam and in the Tenasserim provinces; but I am unaware of its existence in the Indian peninsula. In Tenasserim the *D. cantillans* is likewise numerous; and further south, in the Malay peninsula, Mr. Eyton notices, besides *D. cantillans, saccharinum* and *cruentatum* (Horsf.), a new species described by him as *D. ignicapilla* in *P. Z. S.* 1839, p. 105.

Certain species with shorter bills constitute Mr. Hodgson's division *Myzanthe,* of which the Australian *D. hirundinaceum* is characteristic. Allied to that species is

M. ignipectus, Hodgson. Length about three inches and a quarter, of wing an inch and seven-eighths, and tail an inch and one-eighth; bill to forehead five-sixteenths of an inch, and tarse three-eighths of an inch. Colour of the upper-parts black, with a mingled purplish and green gloss, or, in one Darjeeling specimen before me, they might be termed glossy dark green; under-parts pale buff, with a vermillion patch occupying the greater portion of the breast in the male: the female is without this, and has the upper-parts glossless olive-green: beak blackish, the base of the lower mandible white in the female; and legs dusky. Inhabits Nepal and Bootan.*

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* Mr. Jerdon has also just obtained a specimen in Southern India

I may notice here a beautiful little Nepâl bird lately sent by Mr. Hodgson, which hardly seems to me to belong strictly to the *Nectarinidæ*, though it is evidently a soft-billed honey-sucker, and I know not what else to approach it to. Mr. Hodgson styles it

Myzornis pyrrhoura. The bill of the specimen is mutilated of its extremity, but would appear to have been slightly curved and pointed, moderately slender, depressed, but the ridge of the upper mandible distinctly angulated; nostrils almost closed by an impending scale; and the gape furnished with some delicately fine vibrissæ of moderate length: tarse longer than the middle toe with its claw; toes of mean length, the outer and middle basally connected; claws moderately curved, that of the hind toe much larger than the others; wings much graduated, having the 4th. 5th, 6th, and 7th primaries subequal, and the 3rd shorter than the 8th: tail even: plumage soft, dense and copious, very puffy over the rump, and the feathers of the head scale-like, but not rigid. Length about four inches and a quarter, of which the bill probably exceeds half an inch from the forehead, and the tail measures an inch and a half; wing two inches and three-eighths; tarse thirteen-sixteenths of an inch; and hind-toe and claw nine-sixteenths of an inch. Colour a fine lively green, becoming bright emerald-green on the scale-like feathers of the forehead and crown, which have well defined black centres; lores deep black, continued to beyond the eyes: under-parts paler and tinged with verdigris-grey, having a slight rufous cast on the throat; lower tail-coverts bright yellow: wing-coverts and tertiaries green like the back; primaries black, the first eight having white tips, and all but the graduated outer primaries having their exterior edge partly white; secondaries margined with rufous and then with white, except towards their tips, whereon also they have a terminal white spot; tail dusky, washed with greenish, its feathers having their outer webs dull red to near the tip: bill dusky-horn, and legs apparently have been yellowish-white. Inhabits Nepâl.

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* In the article *Souimanga* by M. Drapiez, of the *Dict. Class. d' Hist. Nat.*, several species are mentioned which are not enumerated in Sir W. Jardine's *Synopsis* of the *Nectariniæ*; and some of these are assigned to Bengal, or to India, (the latter a very vague term as currently employed, being not unfrequently synonymous with what is aggregately called "the East"). I much question, however, if any of these, supposing them to be really distinct, appertain to India proper.

To another nectar-feeding family — the *Meliphagidæ,* I refer the genus *Zosterops,* which is most extensively represented in Australia, where this family is so largely developed. One Indian species — *Z. Maderaspatanus,* would appear to be tolerably common in most parts of the country, from Nepâl to Ceylon, and is numerous also to the eastward of the Bay of Bengal, but I have not yet obtained it in the vicinity of Calcutta. A species from the Mauritius, which I refer to *Motacilla Madagascariensis,* Gmelin, has the bill longer and distinctly incurved, and the tongue long and dichotomously subdivided at its extremity, so as to form a tolerably large brush, as usual (if not constant), among the *Meliphagidæ.* To this family, the genus *Chloropsis* (p. 955, *et seq., ante,*) is generally referred, and Mr. Hodgson inclines to place with it his *Heterornis,* (olim *Cutia*), and even his *Ixops* (vide p. 948, *ante*), but *Heterornis* at least I prefer to range near the *Timaliæ.*

Returning now, after so long a digression, to the catalogue of Darjeeling birds, I have to rectify, at

Page 192, *Linota saturata,* Nobis. This is identical with Mr. Hodgson's *Carduelis Nipalensis, As. Res.* XIX, 157, but now typifying his division *Procarduelis.* Of true *Carduelis,* there are two species upon the Himalaya allied to the European Goldfinch,—viz. *C. caniceps,* Vigors, figured in Gould's *Century;* and *C. Burtoni,* Gould, *P. Z. S.* 1839, p. 90; and one belonging to the Siskin group,—the *C. spinoides,* Vigors, which is also figured in Gould's *Century.*

P. 193. *Pica megaloptera,* Nobis, was previously described by M. Adolphe Delessert, in the *Revue Zoologique par la Societé Cuvierenne,* 1840, p. 400, and again in his *Souvenirs d'un Voyage dans l'Inde,* pt. II, 30, by the name *P. Bottanensis.* The Society has lately procured a specimen of *P. vulgaris* shot on the Chilian Andes; and another common Indian bird from Peru, the *Ibis falcinellus.* I have reason to believe that *Pica Bottanensis* is the species of Magpie so abundant in Afghanistan: but a specimen brought from Chusan by Dr. Cantor was veritable *P. vulgaris.*

P. 194 *Ampeliceps coronatus.* This bird has lost the corneous sheathing of its bill, but the bone was blackened, and the deception is by no means obvious: sides of the face naked; and I now think the bird may be safely ranged in *Gracula,* v. *Eulabes,* Cuvier, vide p. 178 *(bis), ante.*

After the foregoing corrections and emendations, my paper on Darjeeling birds still contains fifteen presumed new species, of which thirteen have been received from that locality; viz. *Indicator xanthonotus, Bucco Franklinii, Xiphoramphus* (olim *Xiphirhynchus) superciliaris, Paradoxornis ruficeps, Cinclidium frontale, Pteruthius rufiventer, Alcurus* (olim *Tricophorus*) *striatus, Accentor variegatus* (olim *Himalayanus?), Turdus mollissimus, Chaitaris grandis, Muscicapula rubecula (Dimorpha superciliaris,* passim), *Phylloscopus reguloides, and Linota fusca:* of the remaining two, the *Gracula?* (olim *Ampeliceps) coronatus* is most probably from Tenasserim; and *Timixos meruloides* is perhaps Australian. Mr. Hodgson has subsequently sent specimens from Nepâl of *Bucco Franklinii, Pteruthius rufiventer, Alcurus striatus, Turdus molissimus, Muscicapula rubecula,* and has informed me of the occurrence there of *Phylloscopus reguloides.*

I remain, Sir,
Your's obediently,
ED. BLYTH.

Appendix.—I have such a multitude of new species of Birds to describe, and there are so many more groups of them which I think I can elucidate, at least as regards their Indian species, that, notwithstanding the great length of the foregoing Report, I shall take the present opportunity to relieve myself of some portion of this constantly increasing *cumulus.*

Genus *Buceros.* The various descriptions of Hornbills to which I have access are, for the most part, highly unsatisfactory and perplexing, for which reason I shall contribute my mite towards the elucidation of the species of this group. Those of India are as follow:—

1. *B. cavatus,* Shaw, apud Gould, in *Century* (not a good figure); also apud Jerdon, *Madr. Jl.* Vol. XI, 37, where the following is correctly described from Mr. Elliot's notes: *B. homrai,* Hodgson, *As. Res.* XVIII, pt. II, p. 169 *et. seq.;* with coloured figure and views of the casque at different ages: Dr. Horsfield, however, in his catalogue of Dr. McClelland's Assamese birds *(P. Z. S.* 1839, p. 164), notices that the *Calao à casque concave* of Levaillant, according to Shaw's

description and specific character, differs in various particulars from the present species, and mentions that there are specimens of the latter from Sumatra in the Hon'ble Company's museum. It is also found in suitable districts throughout India (though not, that I am aware of, in Bengal), is frequent in the Tenasserim provinces, and the Society possess specimens from Assam and Arracan. It does not appear to be subject to any variation of plumage, either sexual or according to age; but there are some differences in the colouring of the bill and casque of the sexes, as noticed by Messrs. Hodgson and Elliot, and also of the irides, which in the adult males are intense crimson, and in the females and young hoary.

Not having Levaillant's plates to refer to, I have no means of forming an opinion respecting his *Calao à casque concave*, further than can be derived from the conflicting descriptions of Shaw and others, though founded on those plates; but as his Rhinoceros Hornbill is erroneously represented to have the tail black with a white tip, instead of white with a black cross-band as in the Homrai, I conclude that his plates of the present species are equally untrustworthy, and feel justified in following Gould and others in retaining the name *cavatus* for Mr. Hodgson's Homrai, which, together with *B. rhinoceros* as above indicated, is the only species of its respective subtype that appears to have been verified up to the present time.

The following details shew the confusion that has arisen from Levaillant's figures, which were doubtless made up from imperfect and perhaps *faultily restored* specimens. Stephens, in his continuation of Shaw's *Zoology* (XIV, pt. I, 80), unites the *B. bicornis* and *B. cavatus* of Shaw, assigning Sumatra as the habitat, wherein I presume that he follows Temminck. In Griffith's edition of the *Règne Animal* (VII, 417), and also in the second (French) edition of that work by its illustrious author (I, 446), the *B. bicornis*, Levaillant, pl. VII, is stated to be the adult female, of which *B. cavatus*, id. IV, is the middle-aged male; to which is added that plates III and V represent "altered individuals." The uselessly brief description annexed in Griffith's work is as follows: — "Black with white patch on second quills; protuberance forming a double horn: Philippine Islands." And there is a figure of the bill and casque, assigned to *bicornis*, in Griffith's work, Vol. VII, plate to p. 435, which might pass for the Homrai, but has the lateral edges of the casque prolonged in front to an extent which I have never seen an approach to on the part of the Indian species, wherein they are usually, if not always, truncated, though it is posssible that they might so grow out in captive individuals. Mons. Drapiez, in the *Dict. Class. d'Hist. Nat.* (Art. *Calao),* suggests that *B. cavatus,* Cuv. and Lev., may perhaps be no other than *B. cristatus,* Vieillot, figured in the supplementary plates to that work, No. XXIII; but this is quite out of the question, and I shall revert to the consideration of the latter species presently.

M. Drapiez, however, describes *B. bicornis,* Lev., Pl. VII and VIII, as a distinct species, differing altogether from *cristatus* and decidedly from the Homrai, stating, that the under-parts and lateral caudal feathers are white, and omitting all mention of any white, or rather fulvous-white, on the hind-head and neck. Inhabits the Philippines and China. Shaw, also, describes the *B. bicornis,* Lev., Pl. VII, and VIII, to have *the upper part of the breast, belly,* thighs, and vent-feathers, white; but the tail to be crossed in the middle, *except on the two middle feathers, with a white bar:* and he asserts it to be a native of India and the Indian isles; though most assuredly there is no species exhibiting such a coloration in India proper. His *B. cavatus,* Lev., III, IV, V, and VI, is stated to have the face and chin black, and the neck pale ochre-coloured, — so far as in the Homrai; *but the whole remainder of the plumage black* (very doubtful, certainly as regards the tail), and he adds a description which obviously refers to the young of some other species, as applicable to the immature state of this one. He also considers *B. hydrocorax* to be the young *cavatus,* in which opinion, however, he is not followed by Stephens.

Lastly, Shaw gives, as a variety of his *B. bicornis,* the species described by Cameli in the *Philosophical Transactions,* Vol. XXIII, (1702-3), p. 1394; but there is a widely different species (from the Homrai at least) in the Society's museum, which satisfactorily accords with the description by Cameli, and is clearly identical with Vieillot's *cristatus* as figured in the supplementary volume of plates to the *Dict. Class.:* apparently differing only from that figure in having the thighs ferruginous, and the primaries, together with their coverts and the winglet, fulvous-white,—at least on one side, the other having only the three first primaries, and some of their coverts, of that colour, the rest being blackish. Cameli's specimen is described to have had the primaries fulvous. This is accordingly a somewhat variable species, subject to have the wings more or less fulvous or fulvous-white, instead of brown-black: *au reste,* the Society's specimen has the upper-parts of a dusky, greenish olive-brown; the face to beyond the eyes, and the crown immediately behind the casque, black; belly also black; the remainder of the head and the entire neck deep ferruginous; thighs pale ferruginous; and tail wholly fulvous-white: bill and casque dull coral-red, the terminal half of the former dark and livid, and a slight admixture of this upon the casque. Length nearly three feet, of wing sixteen inches, and tail thirteen inches; bill to gape six inches, and casque five inches, the latter produced backward far over the crown; the shape of it is inflated, and flattened above, narrowing to a point anteriorly, which however does not protrude forward, the greatest breadth being nearly two inches, and there are no transverse grooves either upon the casque or on the bill itself.

The figure cited of this species is rude (the feet not being represented as *syndactyle),* but decisive as regards the specific characters; the upper-parts being coloured brownish-black, the belly black as in the Society's specimen, and the thighs and vent of the same fulvous-white as the primaries of the latter. But the description in the *Dict. Class.* varies in several particulars, representing the upper-parts to be black, but *the under-parts* with the tail-feathers, fulvous-white; upper mandible yellow, red at its point, and surmounted by a casque rounded laterally, much produced backward, and *creusè en gouttière ouverte par devant;* hence the suggestion of M. Drapiez that this species may be *B. cavatus,* but there is no tendency to such a structure apparent in the Society's specimen, which however may be from comparative youth. The total length is given as three feet (French), and that of the bill seven inches. The females and young are stated to be wholly black, which is improbable as concerns the tail.

The same sexual disparity of plumage occurs in several allied species, whereof the males only are more or less marked with rufous; and both sexes are characterized by having a naked and brightly coloured, inflatable, gular skin. At the head of these may be placed—

2. *B. Nipalensis,* Hodgson, *As. Res.* XVIII, pt. I, 178,— the female, with a coloured figure of this sex: the male having the plumage of the entire head, neck, and breast, bright ferruginous, and that of the

thighs, belly, and vent, ferruginous-bay.* The Society possess fine specimens of both sexes of this large species from the Munneepore hills, and Dr. Pearson has a male from the vicinity of Darjeeling, where others have been met with. It has merely a slight bulge in place of a casque, and the upper mandible only is marked with a series of broad transverse grooves, six or eight in number, which appear, with the entire corneous substance of the beak, to be pushed forward from behind, by a constant increment at the base of the beak, and to be successively worn away anteriorly; the same is very obvious in various other species of Hornbill, and the inference deducible from this fact is, that the beak-sheath of birds generally, like their claws, and other modifications of cuticle, continue to grow at base and to be worn away at the extremity, as familiarly exemplified (at least as regards the growing) by the human hair and nails, and in a more or less obvious degree by all analogous productions.

Next follow several species very closely allied together, the males either resembling in plumage the *B. cassidix* figured in Griffith's work (Vol. VII, pl. to p. 434), or having the head and neck uniformly bright rufous, as in the *Calao de Waygiou* (*B. ruficollis,* Vieillot), figured in one of the plates to Labillardière's Voyage, and also the *B. cristatus* (ante); approaching in this to *B. Nipalensis:* the females of all (so far as known) have the head and neck black; and excepting *B. cristatus* and apparently some immediate congeners to that species, the casque is transversely plaited, and the same naked, inflatable, coloured gular skin exists as in *B. Nipalensis.* Such are—

B pucoran (?), Raffles, obscurely indicated in *Lin. Trans.* XIII, pt. II, p. 293; this being doubtless either the present or the next species, but most probably the present one; and the gular skin is stated to be yellow: *B. ruficollis*, apud nos, ante, p. 176. Male having the medial part of the crown and the whole occiput and nape dark rufous bay, or deep maronne, and the sides of the head and neck, with the front of the latter, glistening yellowish-white,—precisely as in the figure cited of *B. cassidix,* only that the maronne colour is more developed on the occiput and nape than is at least represented in that figure, and forms the usual crest in this genus: all the other parts are greenish-glossed black, except the tail which is buffy-white. Bill yellowish-white, the basal portion of both mandibles dark reddish-brown laterally, with a series of narrow, transverse, whitish ridges, nearly similar to those of *B. cassidix;* the casque is scarcely elevated above the outline of the rest of the upper mandible, but is broad and flat above, having a series of narrow transverse whitish plaits, the intervals between which are nearly filled up with a brownish substance, so that the profile is almost even, and towards the front is worn quite so. As compared with Labillardiére's figure of *B. ruficollis,* the casque of the present species is less elevated, the plaits are much narrower and closer, and do not reach so far as half way along the mandible; the ridges on the sides of the bill itself afford another distinction from both that species and the next, and approximate the present one to *B. cassidix.* Length above three feet, of the wing nineteen inches, and tail ten inches and a half; bill to gape seven inches and a half, and with casque three inches high, the latter nearly two inches broad. Inhabits Sylhet and the Tenasserim provinces.

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* The same sexual diversity of colouring obtains in the nestling plumage.

B. plicatus (?), Shaw; *B. subruficollis,* Nobis, ante, p. 177. Entirely resembles the last species in its plumage, having the sides of the head and neck (in the male) more or less deeply tinged with golden-saffron: but the size is much inferior, though the wings and tail being proportionally longer, the difference in actual admeasurements is not great, though that of the weight would be considerable; the casque is also much more elevate and highly convex, instead of being flattened above; the plaits on it more resembling those of *B. ruficollis,* except that they are considerably more raised than in that species, though far less so than in *cassidix,* and the foremost incline close over the bill as in *ruficollis;* there are also, as in *ruficollis,* no lateral transverse ridges at the basal part of the mandibles, which is a further distinction from *cassidix* and (presumed) *pucoran.* Length about thirty-two inches, of wing sixteen and a half, and tail nine and a half; bill to gape six and a half, and with its casque nearly three inches high, of which the latter occupies a full inch; it is also broad behind, becoming gradually narrower to the front, whereas that of *pucoran (?)* is much more uniform in its breadth throughout. Likewise an inhabitant of the Tenasserim provinces, where apparently very common.

This would seem to be the *B. plicatus* of Shaw, said to inhabit Ceylon, which I much doubt; and I certainly do not believe that it would ever have a black tail with white outer feathers, as Shaw mentions to be the case sometimes (this being characteristic of *B. Malabaricus,* the young of which Cingalese species was probably here confounded with the present one). Stephens annexes, as synonyms of *B. plicatus,* the *B. undulatus,* Shaw, and *B. Javanicus,* Shaw. The latter is described to have the head "pale rufous," whilst in seven male specimens of the present species before me, the head is invariably very dark rufous-bay, or deep maronne: *B. undulatus,* also from Java, is described to have, "at the lower part of the neck, between the shoulders, a moderately large patch of red-brown, adding a considerable ornament to the plumage of that part"; the present bird has nothing of the kind: the female *Javanicus* is stated to be "somewhat smaller, and destitute of the reddish-brown patch between the shoulders."

This may also, rather than the preceding species, be the Sumatran *pucoran* of Raffles, which is stated to have a yellow gular skin: that of *undulatus,* together with the orbits and the space immediately between them and the upper mandible, is described as bluish; that of *Javanicus* as yellowish-white. The two species here described are undoubtedly the two allied Tenasserim races mentioned by Mr. Barb (*J. A. S.,* X, 922), as differing only in the colour of the naked skin of the throat and around the eyes, which in one is of a beautiful blue, and in the other an equally rich yellow: it is impossible to form any decided opinion from the dry specimens; but it would seem from them that the larger or *pucoran* (apud nos) is the yellow-throated species, and the smaller or *plicatus* the blue-throated.

In Griffith's work (VII, 418), *B. Javanicus* is placed among the species without a casque; and I have no confidence in the synonyms attached, particularly as the *Calao de Waygiou,* or *B. ruficollis,* Vieillot, is included among them. There are evidently several allied species which require further investigation, unless they have been subsequently elucidated, which is most probable.

In a series of nine specimens before me of *B. plicatus,* the curious fact of the successive advance forward of the ridges of the casque, in consequence of the growth from behind, is particularly manifest. In none of these specimens does the number of transverse ridges exceed seven, and it is obviously apparent, upon inspection of the series of specimens, that these ridges are thus pushed forward till they finally scale off anteriorly, while others are continually in process of formation behind; also that in young birds they are individually much larger and thinner in substance, becoming narrower and closer by degrees. I remember making an analogous observation in the instance of the very remarkable long-legged Abyssinian Hornbill (or *Abba Gumba* of Bruce, sub-genus *Bucorvus* of Lesson), the casque of which forms a hollow tube, open in front in the adult, and which continually advances forward, the extremity shredding off, from time to time, in form of a ring. We have seen that the transversely grooved plating on the sides of the base of the upper mandible of *B. Nipalensis*, and necessarily of *cassidix* and what other species possess an analogous structure, is constantly renewed behind and worn away in front in like manner.

I now return to the ordinary Hornbills without a gular bag, and of which the sexes are similar in plumage, as exemplified by *B. cavatus*, *rhinoceros*, *Malabaricus*, &c. It is among these that the casque attains its maximum dimensions, being generally not large in the preceding group. I have already remarked that Levaillant's figure of *B. rhinoceros*, which is copied by Shaw, represents the tail to be black with a white tip, and the rest of the plumage to be wholly black; whereas the considerable number of specimens which have passed under my observation have invariably had the thighs, vent, and lower tail-coverts, white, and the tail white with a black cross-band as in *B. cavatus*: a circumstance which tends exceedingly to diminish our faith in the alleged colouring of *B. cavatus*, as distinct from the Indian Homrai. Sir Stamford Raffles rightly remarks that the female of *B. rhinoceros* is smaller, with the horn more recurved; and that the iris is white, while that of the male is red: this corresponds with Mr. Hodgson's observation of the diversity of colour of the irides in the sexes of *B. cavatus*, and which probably obtains likewise in *Malabaricus* and some others.

The two next have been much confounded, for which reason I shall describe them fully.

3. *B. Malabaricus* (verus), Latham; *B. monoceros*, Shaw, and probably also *B. violaceus*, Shaw: *Bægma Dunnase* of Lieut. White, *As. Res.* IV, 119. Black with white under-parts from the breast, also the tips of the primaries and secondaries, and the entire three outer

tail-feathers on each side, with more or less of the next pair: bill and part of the casque yellowish-white, having a flesh-coloured spot at the base of the lower mandible, spreading on the throat, which is bare of feathers except along its middle; contiguous to this, the base of both mandibles is black, extending obliquely downward and forward from before the eye, also the hind-margin of the casque (in the male only), and a large patch of the same occupies the anterior three-fourths of the casque in old specimens, but never reaches downward to the upper mandible (as in the next species): casque very large, and exceedingly compressed laterally, protruding far backward over the crown, and its ridge terminating in an acute angle anteriorly, being prolonged considerably beyond the junction of the casque with the upper mandible. Female similar but rather smaller, the bill and casque proportionally not so large, there is no black on the hind-edge of the latter, and the irides are also probably not crimson as in the male. The young have at first no black on the incipient casque, which appears and increases in quantity with the growth of the latter. Entire length of an adult male nearly three feet, of which the tail measures nearly fourteen inches, and the bill from gape seven inches, being with the casque four inches high; closed wing thirteen inches, and alar expanse three feet and a quarter. Inhabits the peninsula of India, being replaced to the eastward by the next species. Raffles, indeed, includes it in his catalogue of Sumatran birds; but *B. albirostris* has been so frequently confounded with it, that the latter is perhaps here meant, the more especially as Dr. Horsfield includes *B. albirostris* in his catalogue of the birds of Java: possibly, however, both of these notices refer to the *B. bicolor* of Eyton, which I will describe presently.

B. violaceus of Shaw is stated to resemble *Malabaricus* in size and plumage, except that its glosses are brighter and more iridescent, and that "the base of both mandibles, as well as that of the casque, is ornamented with a band of crimson, which at the base of the lower mandible extends to some distance beneath the eyes, and is crossed by two narrow black bars." Described and figured by Levaillant from a living specimen, said to have been brought from Ceylon; and a figure of the bill and casque is given in Griffith's work (VII, plate to p. 435, being doubtless copied from Levaillant), wherein the casque is represented as essentially similar to that of *Malabaricus* of corresponding age, but the black is not continued forward to its tip, and there is a white or pale line throughout the length of the casque near its ridge, which is not mentioned to occur by Shaw; Capt Tickell, however, in his description of *Malabaricus* (*J. A. S.* II, 579,) mentions " a broad lateral irregular line of yellow, occupying nearly the whole length of the casque;" but this does not occur in the specimens which he has presented to the Society, unless the lower border of the casque be intended, which is not probable; and he does not mention any crimson at the base of the bill, but only the flesh-coloured base of the lower mandible and adjoining black, as usual. At most, I conceive that *B. violaceus* is but an occasional variety of *B. Malabaricus,* and which needs verification.

4. *B. albirostris,* Shaw; *B. leucogaster,* Nobis, *J. A. S.* X, 922,—the young: generally placed as a synonym of *Malabaricus,* which species it represents in Bengal, Nepal, Assam, and the Tenasserim provinces, and according to Dr. Horsfield it likewise occurs in Java. Its size, however, is much inferior, and the four pairs of lateral tail-feathers are only tipped with white: the casque, also, is much less compressed, in fact considerably bulged or inflated, and the black patch upon it is much smaller, appearing only on the extreme tip of the ridge, but spreading downward and backward over part of the middle of the upper mandible, which latter it never reaches in *Malabaricus;* the cutting edges of both mandibles are also more or less black in *albirostris.* Length of wings and of tail ten or eleven inches only. The finest head before me measures six inches and a half from point of upper mandible to gape, the bill and casque being above three inches and three-quarters high, of which the latter is half; length of casque seven inches, the hind portion protruded far backward over the crown, and the anterior part gradually narrowed, and terminating in a less acute angle (as viewed laterally) than in adult *Malabaricus.* Throat but partially feathered as in that species, and the same fleshy spot at the extreme base of the lower mandible.

Allied to these are some species in the Malay countries, as apparently the *B. Malayanus* of Raffles, and the following:—

B. bicolor, Eyton, *P. Z. S.* 1839, p. 104. Wholly black, except the terminal three inches and a half of all but the middle pair of tail-feathers, which are white: the beak and its casque are spotless yellowish-white, excepting the base of the former and hindmost part of the latter, which are black: head crested, as usual. The casque is allied in form to those of the two preceding species, but especially to that of *B. albirostris*, being less inflated than in the latter, and much less compressed than that of *B. Malabaricus;* moreover, its front does not project forward as in the last mentioned species. Length about two feet and three-quarters, of which the middle pair of tail-feathers rather exceed fourteen inches, these being two inches longer than the next pair, and the rest graduating but slightly; wing twelve inches and a half; bill to gape five inches and a half, and casque rather exceeding five inches. The young, according to Mr. Eyton, have the incipient casque black. Originally described from the Malay peninsula, but the Society's specimen is probably from the Moluccas.

5. *B. Ginginianus*, Shaw: *Putteal Dunnase* of Lieut. White, *As. Res.* IV, 121: common Grey Hornbill of India generally. A small species, with a low and compressed casque, the ridge prolonged anteriorly to a very acute angle, and the hind part concealed by the feathers of the forehead, and not extended backward over the crown. General colour grey, paler below, and from the breast gradually albescent; ear-coverts darker, and a light streak over the eye; primaries and secondaries dusky, the latter margined with grey, and all tipped with white; tail also black near the end, and tipped with white. Bill and casque dusky, the tips and ridges of both mandibles whitish.

In the colouring of the tail of this little species may be discerned a slight approach to the extraordinary Helmeted Hornbill (*B. galeatus*) of the Moluccas, wherein the middle pair of tail-feathers, which in the present species and some others exhibit a marked tendency to be prolonged considerably beyond the rest (as in *Prionites, Crypsirina*, &c.), attain an extraordinary developement; and it is remarkable that in *B. galeatus* the portion of them chiefly from the tips of the next pair to the subterminal dark band are generally much nibbled away by the bird, except when quite newly put forth, and to such an extent in the Society's adult specimen, which has one of its long middle tail-feathers new and the other old, that, in the latter, the barb is pretty well bitten away, as so usual in *Prionites*. This latter singular genus, which presents the nearest approach to the Hornbills in the

New World, (very much more than the Toucans, which are far more closely related to the Barbets,) is provided with an efficient serrature to both mandibles, by means of which the species nibble away the web of their middle tail-feathers at that part so closely, that it sometimes requires a magnifier to perceive that the truncation is artificial; still it does not appear that this can be cited among the tokens of affinity which connect *Buceros* and *Prionites*, for in other birds having the same form of tail, which exhibit no particular affinity for these *Syndactyli,* as *Crypsirina* for instance, the same nibbling of that part is frequently apparent.

Having mentioned *B. galeatus,* I am induced to add, that observation of the habits of this species, more than of any other, is likely to acquaint us with the intent of that rostral appendage for which most of the members of this genus are so remarkable. *B. galeatus* has a short and nearly straight, and thus powerful, beak, and its casque has a mass of solid bone anteriorly, to which no other species appears to offer the slightest approach: now this must be for work of some kind, requiring extraordinary protection for the forehead; and other species constantly wear the casque away in front, by some means: moreover, in seeming reference to the liability of the excrescence to detach particles from above, the eyes of these birds are protected by very stout lashes, as is also the case with the *Crotophagæ* of tropical America, which have likewise a rostral protuberance very similar to that of several of the smaller Hornbills; but the lashes are equally found in those Hornbills which have the appendage small or altogether wanting, as well as in the Coucals *(Centropus)* and various other *Cuculidæ* additional to *Crotophaga:* the presence of eye-lashes is, however, very rare in the class of Birds, the only other groups which I remember as possessing them being the *Raptores* generally (which have slight lashes), the *Cursores* or Ostrich group, and that extremely remarkable and isolated American bird the Hoazin *(Opisthocomus),* which can be approximated to nothing else.

Another peculiarity of the Helmeted Hornbill is its naked neck and interscapulary region, which, added to its short beak, and solid-fronted casque, and the extraordinary length of its middle tail-feathers, seems to indicate this bird as a subgeneric form of *Buceros,* quite as distinct in the *Bucorvus* of Lesson founded on the long-legged Abyssinian species.

The only remaining Indian Hornbill is

6. *B. Gingalensis,* Shaw ; *B. Bengalensis,* Gray, in Griffith's work, though extremely doubtful as even occurring in Bengal. Size of *B. Ginginianus,* the beak large but without a casque (vide figure in Griffith's work, VII, pl. to p. 435) : " the colour of the upper part of the head and the back is blackish brown, with a cast of bluish-grey, the smaller coverts edged with black, marking out that part of the plumage into so many scale-like divisions: the face and under-parts are greyish-white, deeper on the belly and thighs: the two middle tail-feathers are bluish-grey, and the rest somewhat deeply tipped with white." Originally described from Ceylon, and also frequents lofty jungle on the Malabar coast. The Society possess no specimen.

Halcyon Smyrnensis, var. ? *albogularis,* Nobis. Differs from *H. Smyrnensis* in having the white of the under-parts confined to the throat, and the black wing-patch extends over the entire coverts, excepting those of the primaries and the winglet, and also replaces the rufous on the shoulder of the wing. Habitat uncertain. Among a great number of Indian specimens of *H. Smyrnensis,* I have found no variation whatever, the plumage being exactly as described by Mr. Strickland in *An. and Mag. Nat. Hist.,* August, 1842, p. 443, this description having been drawn up from a Syrian specimen: and I may remark that the young bird, in its first plumage, is marked and coloured precisely as in the adult, only its hues are not so bright, and the bill is dusky above with a yellow tip.

Picus, subgenus *Gecinus,* Boié; the Green Woodpecker group, exemplified by *P. viridis* and *P. canus* of Europe, specimens of both of which are in the Society's museum, the latter species received from Norway. This subgeneric form, peculiar to the old continent, has numerous representatives in India and the neighbouring countries. Two species are figured in Gould's Century of Himalayan birds, but in disadvantageous contrast to the later figures by that naturalist; and there are others nearly allied and hitherto confounded with them.

1. *P. squamatus,* Vigors, *P. Z. S.* 1831, p. 8; Gould's *Century,* pl. XLVIII: *P. dimidiatus (?),* apud Hardwicke and Gray, not of Temminck and Wagler. Length thirteen inches and upwards, of

wing six inches and a quarter, and middle tail-feathers five and a quarter; bill to forehead an inch and three-quarters. Upper-parts rather dull green, the rump and upper tail-coverts much brighter yellowish-green: throat, fore-neck, and breast, greyish, without any markings; the breast slightly tinged with grey in some, and always the sides of the neck, passing into the hue of the nape: under-parts from the breast white, each feather subterminally margined with dusky-black, and a few having also a slight line of the same on part of the shaft; the under tail-coverts doubly marked with arrow-head bars: primaries dusky, with a series of white spots barring their outer webs, and the margin of their inner webs towards the base; the rest of the large wing-feathers barred throughout the margin of their inner webs, as seen conspicuously on the under surface of the wing: each feather of the tail is also conspicuously barred throughout on both webs: the outer margins of the secondaries and tertiaries, together with their larger coverts, are obscurely barred with a lighter colour; and the primary coverts and the winglet are marked like the primaries. The male has the forehead and crown crimson, and the occiput inclining to scarlet; which parts are in the female black, the feathers laterally margined with light grey, as is also a streak from the corners of the mouth in both sexes, which is bordered above by a white one continued from the nostrils, and this again surmounted by a black one between the bill and eye; there is also a white streak over the eye: bill yellowish, the base of the upper mandible dusky. The young have a mottled appearance, the margins only of the feathers of the upper-parts being green, bordering a dusky tint; the barring of the tertiaries is more developed; and the breast and lower-part of the fore-neck are marked nearly like the belly, whereon the black portion of each feather is much broadened internally, contracting the pale medial space within: the crimson tips of the coronal feathers of the young male are much less developed than in the adult, and there is scarcely a trace of red upon those of the occiput: bill chiefly blackish. Gould's figure of this species is much over-coloured, representing a green breast, instead of greyish with at most a very faint tinge of green; and the wings should be much more sombre olivaceous-green; the abdominal markings are likewise badly represented. Hardwicke's figure assigned to *P. dimidiatus* by Gray, would appear also to be a bad representation of the present species, with the barred appearance on the secondaries and tertiaries much exaggerated. The *P. squamatus* appears to be peculiar to the Himalaya.

The following two species appear to be confounded under *P. squamatus* in Mr. Jerdon's list:—

2. *P. striolatus,* Nobis. Smaller and brighter-coloured than the preceding, with the throat, neck, and breast, marked nearly like the belly, and the caudal bars almost obsolete, except on the middle pair and exterior web of the outermost pair of feathers in some specimens. Length about eleven inches, the wing five inches, and middle tail-feathers four inches; bill to forehead an inch and a quarter. Head and upper-parts like those of *P. squamatus,* but the colours brighter; the dark streak from the corners of the mouth inconspicuous, from the black being reduced to a narrow medial line on each feather; and there is no black mark occupying the upper half of the loral feathers: the entire under-parts are whitish, not suffused with green as in the next species, but streaked with dusky green, more or less dark on the breast, and always greenish-black on the belly; upon the throat and fore-neck the feathers have each a mesial dark line, more or less defined, which on those of the breast and sometimes above it widens, and is divided to near the tip of the feather by a central whitish streak, which latter also widens on the belly till the feathers of that part present much the same appearance as those of *P. squamatus,* only that a mesial dark line within the white is a great deal more prevalent, and the general aspect of the markings is somewhat less clearly defined than in that species: the sides of the neck are greenish and more obscurely streaked, and the nape and interscapularies are in some specimens indistinctly marked like the feathers of the breast: bill yellowish, the ridge of the upper and tips of both mandibles dusky. Female analogous to that of the preceding species. The Society possess specimens from the Himalaya and Central India, and have received this together with the last species from Mr. Hodgson, who failed to discriminate them.*

3. *P. viridanus,* Nobis. Size about that of the last species, and much resembling it, but the neck, breast, and under-parts very deeply tinged with green, having a strong fulvous cast, and the tail longer,

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* More recently, however, Mr. Hodgson has distinguished these two species.

and spotted instead of barred with fulvous white, which in some specimens is obsolete on all but its middle pair of feathers. Length about twelve inches, of wing five inches and a half, and tail four and a half; bill to forehead an inch and three-eighths. Head as in *P. squamatus*, the ear-coverts grey, and streak from the corners of the lower mandible as in *P. striolatus*, or broad and consisting of white feathers having a black central line, which in *P. striolatus* is less strongly defined, and the streak is in that species so nearly similar to the striated adjoining plumage as to be little conspicuous: throat greenish, contrasting with the streak from the corners of the mouth; and the neck green deeply tinged with buff all round, having only indistinct striæ in front; breast the same, the markings becoming more defined, and on the belly they are strongly defined; the ground-hue of the breast is deeply suffused with fulvous-green, having a dark green double streak on each feather uniting at the tip, and a narrow medial line upon the shaft, the lateral edges of the feathers inclining to be albescent; on the belly the ground-hue is whiter, and the marking of the feathers is nearly as in the foregoing species, but with sap-green, instead of black as in *P. squamatus*, and greenish-dusky as in *P. striolatus*: on the sides of the breast, or rather of the fore-part of the abdomen, the feathers have a broad dark green streak on their outer web, away from the shaft, and a narrow one on their inner web adjoining the shaft, besides which the lateral edge of the inner web is also dark green; the corresponding feathers of *P. striolatus* have the whitish part much broader, and containing a broad mesial streak of greenish-black, which again has a central white mark in some: the upper-parts resemble those of *P. striolatus* in brightness of colouring; and the middle tail-feathers are marked with dingy pale spots along the exterior of both webs, more or less trace of which exists also on the outer webs of the other tail-feathers: bill black, the lower mandible bright yellow except at tip. The female I have not seen. A male in its first plumage has all the colours duller, and the markings of the breast and under-parts very indistinct. The Society's specimens are from Arracan, except the young one which was obtained further South, being the so-termed *P. squamatus* of Vol. X, p. 923. Mr. Jerdon, however, clearly enough indicates this species in the description of his *P. squamatus* of Southern India.

4. *P. occipitalis,* Vigors, *P. Z. S.* 1831, p. 8; Gould's *Century,* pt. XLVII: *P. barbatus,* Hardwicke and Gray, apparently a bad representation of the female: *P. affinis (?),* Raffles, *Lin. Trans.* XIII, pt. II, 288, which name would hold precedence. Length about twelve inches and a half, or perhaps thirteen inches in the recent specimen, of wing six inches, and middle tail-feathers four and a half; bill to forehead an inch and five-eighths. General colour green, but much less vivid than represented in Gould's figure, the rump brighter and more yellowish green as usual, though in one of eight specimens before me the hue of the rump is all but uniform with that of the rest of the upper plumage, and the same specimen has also the tail quite plain, whereas in all the rest the middle tail-feathers are barred (in general conspicuously) with dingy greenish, and occasionally the other tail-feathers obscurely so, especially the outermost: the under-parts likewise vary, being in some nearly as bright green as the upper, and in others pale dusky-ash, with sometimes a few green and partially green feathers intermixed: throat pale; the sides of the head grey; a black streak from the corners of the mouth, the feathers of which are laterally edged with grey in the female; and crown of the male crimson, the occipital region black continued to the nape,—the crown of the female being black with grey lateral edges to the feathers, and the occiput pure black as in the male: primaries and their coverts barred with a series of white spots on their outer webs, and wings underneath marked as usual in the group: bill wholly dusky black. Inhabits the Himalaya, and also the Tenasserim provinces; likewise Sumatra, if this be the *P. affinis* of Raffles, described as follows:—

"This species is *about ten or eleven inches in length,* dusky-green above, with a shade of yellow on the lower part of the back; cinereous *or slightly ferruginous* below, *mixed with brown on the abdomen.* Quill-feathers brown spotted with white. Tail-feathers brown, pointed as usual in this genus; the two uppermost with a few light-coloured spots along their inner margin. A gray patch encircles the eyes, bounded below by a black stripe mixed with white spots, which runs from behind the lower mandible. In the male the crown of the head is red, often variegated with black, each feather being black at the base and red at the tip; in the female it is *entirely black.*

The bill and feet are blackish-blue." I have italicized the few particulars wherein it would appear to differ from the species above described, and considering its alleged inferiority of size, I think that it will not improbably prove distinct.

The two next species resemble in having a nuchal crest of brilliant yellow silky feathers, much as in *P. (Brachylophus) mentalis*, which is also a green-bodied species, though pertaining to a different subgroup of Woodpeckers; and the first of them has also the primaries barred with ferruginous and black, nearly as in *P. mentalis*, and also much resembling the general colouring of *P. pyrrhotis*, Hodgson, *J. A. S.* VI, 108, which latter species, so far as I can judge from a young specimen, would seem to be best ranged in *Gecinus* (the subgenus under consideration): in other respects, the two following Woodpeckers do not appear to be particularly allied, further than that in both the rump is nearly or quite of a uniform green with the back.

5. *P. flavinucha*, Gould, *P. Z. S.* 1833, p. 120; *P. flavigula*, Hodgson, *J. A. S.* VI, 106, which see for description. It appears to be not uncommon in Nepál, and also in Arracan.

6. *P. Nipalensis*, Hardwicke and Gray, *Ill. Ind. Zool.*, badly figured; *P. mentalis* apud Jerdon, *Madr. Jl.* Vol. XI, 214, but not *P. (Brachylophus) mentalis* of Temminck. Much smaller and less robustly formed than the preceding species. Length about nine inches and a half, the wing five and a quarter, and middle tail-feathers four and a half; bill to forehead about an inch. Colour of the upperparts bright green, the throat whitish, with dusky tips to the feathers, which latter become so much developed on those of the foreneck and breast, that these parts appear wholly dusky, having sometimes a slight ashy, and sometimes a greenish, cast; belly and flanks dingy whitish, with dusky cross-bars: lores whitish, surmounted by black, over which (in the male) commences a crimson streak meeting its opposite on the forehead, and continued backward to the occiput, this crimson being confined to the occiput in the female; the white of the lores is continued as a streak to the lowermost ear-coverts, and the male has an admixture of crimson on the moustachial plumes: the large wing-feathers are bright ruddy on their outer webs (anterior to the emargination of the primaries), which are margined with green, slightly on the primaries and deeply on the secondaries and ter-

tiaries; underneath, the wings are dusky, barred with greenish-white: tail blackish, its middle pair of feathers margined with ruddy-green: bill dusky, laterally marked with yellowish except at tip; "legs sap-green; irides reddish-brown" (Jerdon). Common on the Himalaya, and occurs rarely in other parts of India, including the vicinity of Calcutta.

Mr. Jerdon suggests that the *P. chlorolophus* of Vieillot may be the young bird. In the *Dict. Class.*, I find a *P. chloropus,* Vieillot, from Bengal, described, which is most probably a variety only of the present species, in which case the name would take precedence. It sufficiently agrees in general respects, except that the supercilium and a subocular line are stated to be pointed with yellow, instead of crimson, the primaries are said to be externally spotted with yellowish-white, and the throat and fore-part of the neck to be greenish, which last is fully applicable to many specimens.

In *Proc. Zool. Soc.,* for 1841, p. 31, Mr. Strickland indicates three groups of Woodpeckers included under *Brachylophus* of Swainson; viz. the green Woodpeckers (*Gecinus,* Boié),—the crimson-winged species (*miniatus, puniceus,* and *mentalis*), to which he proposes to restrict Mr. Swainson's term *Brachylophus,*—and the short-thumbed species, exemplified by the commonest of Indian Woodpeckers (*P. aurantius,* Lin., v. *Bengalensis,* Gm., v. *nuchalis,* Wagler, v. *hemipodius,* Swainson), which group he characterizes by the appellation *Brachypternus.* This last division, however, still does not appear to me to be rightly constituted, but comprises two very distinct forms, namely, that of the rudimental-thumbed *P. aurantius,* which I think should be placed with those Indian species (*Chrysonotus,* Swainson, comprising *P. tiga, Shorei,* and *Grantia,*) wherein the thumb entirely disappears, and in this case the name *Brachypternus* would be no longer applicable; the other group having a well developed fourth toe, and being altogether much more powerfully formed, and highly typical or characteristic of the Woodpecker structure. To this last, which may be designated *Chrysocolaptes,* appertain *P. strictus,* Horsfield, (v. *sultaneus,* Hodgson),* *P. hæmatribon,*

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* This is generally, I believe, now considered to be *P. Goensis,* though the description of the latter by Daubenton and others certainly does not apply.—Referring to Dr. Horsfield's catalogue of Javanese birds prefixed to his Volume of Researches, I observe that he there refers his *P. strictus* to *P. Goensis.*

Wagler, and also I believe certain other species, together with the following:—

P. (Chrysocolaptes) melanotus, Nobis. Length above a foot, of which the tail exceeds three inches and a half; wing six inches; beak to forehead an inch and seven-eighths; long hind-toe and claw an inch and a half; short hind-toe and claw three-quarters of an inch. Crown and occiput of male splendid carmine, less crimson than in *P. strictus*, but otherwise nearly similar, only not converging to a peak behind; forehead mingled black and white; a white streak commences behind the eye, and is continued to the nape, the entire hind-part of the neck being wholly white, much more broadly so than in *P. strictus*, and extending down upon the interscapularies; the rest of the back, rump, tail, and scapularies, are brownish-black, having a slight aureous cast on the last; wings bright golden-yellow, less vivid on the volar feathers and their larger coverts; the bend of the wing, with the winglet, and the coverts of the primaries, dull blackish; primaries dusky, having distantly placed large round whitish spots on their inner webs, and dull similar spots on the outer webs of those contiguous to the secondaries; there is a broad black streak down the sides of the neck from the eye; and the under-parts are handsomely streaked, commencing with three black stripes on the throat upon a white ground; on the breast the feathers are white with black lateral edges, which last gradually almost disappear on the belly: bill blackish; feet apparently have been lead-coloured; and the irides are marked to have been "brilliant pink-red." This beautiful bird was obtained near Midnapore.

I have other Woodpeckers to describe, but they require some further elucidation at present; and of allied forms, Mr. Hodgson has recently sent the *Picumnus innominatus*, Burton, *P. Z. S.* 1835, p. 154, vel *Piculus* (olim *Vivia*) *Nipalensis*, Hodgson, *J. A. S.* VI, 107, which is perfectly true to the generic type of *Picumnus minutus*, Tem., of the West Indies and Guiana; and the *Comeris* (olim *Sasia*) *ochracea*, Hodgson, *J. A. S.* V, 778, which I suspect will come under the *Microcolaptes* of Temminck, founded on his *Picumnus abnormis*. The *Sasia ochracea*, Hodgson, was obtained by Dr. M'cClelland in Assam.

[The following I have just received from Darjeeling.

Picus (Dendrocopus, Sw.) *cathpharius,** Hodgson. Length about seven inches and a half, of wing four inches, and middle tail-feathers two and a half; bill to forehead seven-eighths of an inch. Colouring as in *P. Himalayanus* (XI, 165), except that the under tail-coverts are not red, and the crimson of the occiput extends behind the ear-coverts to the black streak below them, tending to be continued into a gorget on the breast, where the feathers have a crimson tinge: the bill also is proportionally much smaller than in that species, and of a white colour; and the tail is less rigid and pointed: — the general form being that of the European *P. minor.* Upper-parts black, with a white wing-patch, and series of white spots on both webs of the large alars: lower-parts fulvescent-brown, the feathers below the fore-neck having mesial black streaks; there is a black stripe from the lower mandible along the sides of the neck, and above it a whitish stripe through the eyes to the ear-coverts inclusive, commencing on the sides of the forehead; the two outer tail-feathers are barred with whitish, and the next one spotted with the same on its outer web only; and the occiput of the male is crimson as described, extending laterally behind the ear-coverts. A Nepalese female in nestling dress (sent by Mr. Hodgson) is rather smaller, with no red on the occiput, but traces of it on the breast as in the adult male; and the outer tail-feathers have the pale bars broader than the black ones, being the reverse of what is seen in the adult: bill chiefly dusky.]

(To be continued.)

Addenda.—As the remainder of the foregoing Appendix will appear in a subsequent number, I shall introduce here a few notices referred to in a note to p. 941, ante.

Rhizomys from Arracan, p. 925. I have just seen two specimens of the true *Rh. badius,* Hodgson, from Darjeeling; and the species is distinct from the Arracan one, although Mr. Hodgson's description of *Rh. badius* will apply to either of them. The Nepalese species is in colour wholly slaty-grey, having the fur of the upper-parts tipped with dark rufous-brown, but shewing only a slight trace of this hue on the under-parts, which are glistening dark cinerascent; the brown tips of the dorsal fur are also somewhat glistening; and the feet are dark. The other I now designate

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* A latinization of different native names, or rather modifications of the same name, for Woodpeckers in general.

Rh. castaneus, Nobis. Size and structure of the preceding, but the entire colour very much lighter, and the fur considerably less dense: base of the piles pale dusky-ash tipped with vivid light chesnut-bay, which is denser and consequently appears brighter on the cheeks and sides of the head: under-parts merely paler than the upper, the faint ashy hue of the bases of the piles inconspicuous: feet semi-nude and flesh-coloured; the claws pale: and towards the cleft of the upper lip albescent. Inhabits Arracan.

Note to p. 928. Among some Darjeeling mammalia lately collected by Capt. Charleton, is a beautiful specimen of the *Felis marmorata*, Martin, *P. Z. S.* 1836, p. 107; which, like the *F. macrocelis* (to which it is allied), was originally described from a Sumatran example. It is the species referred to *F. Diardi* in the volume on *Felinæ* in the 'Naturalist's Library.'

Note to p. 933. Mr. Hodgson now suggests the name *Hemirhynchus* in lieu of *Temnoris*.

P. 938. Capt. Charleton also possesses a specimen of *Sitta formosa*, Nobis, the wing-primaries of which agree in relative proportion with those of other Nuthatches: and he has several examples of the green *Kitta* according precisely with that described, which, as Mr. Hodgson informs me, are merely in the ordinary plumage newly put forth, the colour changing to blue after a certain amount of exposure.

The same collection has also yielded a fourth species of my genus *Cyornis*, as alluded to in a note to p. 941; viz.

C. unicolor, Nobis. Differs from the three others, in having no ferruginous on the under-parts; whilst the upper are of a lighter blue than in *C. rubeculoides* and *C. banyumas*, and of a much brighter and less greyish blue than those of *C. Tickelliæ:* lower-parts paler and tinged with verdigris, being still lighter on the belly. The only specimen examined was killed while moulting, and retains many of its mottled nestling feathers, especially upon the head and throat, also the wing-coverts, and an intermixture of them on the bright blue dorsal plumage: these nestling feathers are pale fulvous-brown with narrow black margins on the clothing plumage, the wing-coverts are dusky with pale fulvescent tips, and the large alars are tinged with cyaneous, the tertiaries having small fulvescent tips like the wing-coverts. Length about six inches and three-quarters, of wing three and one-eighth, and tail two and three-quarters; bill to gape thirteen-sixteenths of an inch, and tarse five-eighths of an inch. Occurs at Darjeeling.

P. 942, *note to preceding page.* No. 51 of the birds of Capt. Tickell's list.—Since this was printed, Mr. Jerdon has written me word, among other matters, — " I have also another Barbet sent from the west coast, very like *viridis*, but distinct, and evidently the *Bucco lineatus* of Tickell's list."

Note to p. 952. Mr. Hodgson informs me that the word *leucopophlus* alluded to, was, as I suggested, a copyist's mistake for *leucolophos;* and I perceive that there is an " *Ianthocincla leucocephala*, Gould," mentioned in a list of Bengal birds published in the ' Annals and Magazine of Natural History' for June, 1842, p. 477, which I also suspect is intended for *leucolophos.*

P. 961. *Pitta gigas*, apud nos. In a very interesting collection just received from Arracan, there are two fine specimens of this *Pitta*, which I now think must be distinct from *P. gigas*, in which case the species might be termed *P. cyanea.* These birds have the crown brown, with a black medial stripe, the occiput bright red, and throat whitish, having a black stripe on each side; the rest of the upper-parts are entirely of a fine blue, and the lower pale blue, sullied with green on the breast, and mottled with black as described. Length about nine inches.

P. 966 *Phylloscopus magnirostris*, Nobis. The same collection has yielded a second specimen of this new species.

P. 969 et seq. *Nectarinia, Dicœum,* &c. Three species of this group are also sent, of which two appear to be new; viz.

Nectarinia Phayrei, Nobis. This beautiful species pertains to the group exemplified by the Indian *N. Zeylonica* and *N. minima*, and nearly agrees with Sir W. Jardine's description of *N. Hasseltii*, Tem., in the *Nat. Libr.*, but has the " mantle," or at least the interscapulary region, deep black. Length about three inches and three-quarters, of wing an inch and seven-eighths, and tail an inch and a quarter; bill to forehead half an inch. Crown brilliant golden-green, the feathers of soft and disunited texture; cheeks, sides and back of the neck, interscapularies, and wings, deep black; tail also black, richly glossed with purple; scapularies, rump, and upper tail-coverts, brilliant steel-blue; throat and fore-neck splendid amethystine-purple; breast, and flanks anteriorly, rich dark red; posteriorly, with the vent and under tail-coverts, dull greyish-black: bill and feet black. Inhabits Arracan, and is dedicated to its discoverer Capt. Phayre, the present Senior Assistant to the Commissioner of that province, to whom the Society is indebted for numerous zoological contributions of much interest.

Dicæum chrysochlore, Nobis. A thick-billed species, devoid of shewy colouring. Length about four inches, of wing two inches and one-eighth, and tail an inch and a quarter; bill to forehead three-eighths of an inch. Upper-parts uniform vivid, but glossless, golden-green, including the tertiaries, the margins of the secondaries, and their coverts; the rest of the wing, and the tail, dusky black, the latter margined towards its base with the colour of the upper-parts, and the primaries slightly with yellowish-white: entire under-parts slightly yellowish-white, except the lower tail-coverts which are bright yellow; the breast and flanks being streaked with dusky, and a line of the same proceeds from each corner of the lower mandible: inside of the wings chiefly white: bill and feet blackish. Inhabits Arracan. The third species sent is *D. erythronotum*.

The discovery of *D. chrysochlore* enables me, I think, to classify a very curious little bird, (the affinities of which have long puzzled me,) from Nepâl, but which I have not now by me for comparison, as Mr. Hodgson took the specimen away with him. The following is, however, the description which I took of it:—

Pachyglossa, Hodgson, *n. g.* Bill rather short, and very Swallow-like as viewed from above, but less depressed, with the ridge of the upper mandible obtusely angulated, and the terminal half much compressed from the inflection of its tomiæ; nearly conical as viewed laterally, the outline of the upper mandible curved, and its tip overhanging that of the lower mandible; the outline of the lower mandible is almost straight. Nostrils nearly closed by impending membrane, the aperture forming a narrow slit (in the dry specimen). Gape unarmed. The wings are large, having no rudimental first quill, but the three first primaries are subequal, the third rather the longest, and the fourth is a little shorter than the first; they extend to three-fourths of the length of the tail, which latter is rather short. Tarse short, but nearly equal to the middle toe with its claw: the toes formed for perching, the inner shorter than the outer toe; and claws rather short, moderately curved, and much compressed.

P. melanozantha, Hodgson. Length about four inches and a half, of wing two and seven-eighths, and tail an inch and a half; bill to frontal plumes five-sixteenths of an inch, and tarse half an inch. Upper-parts dusky-cinereous, tinged with dull olive-green on the head, and partially elsewhere; upper tail-coverts of the latter hue: lower parts paler, the throat white, passing down the centre of the fore-neck and breast; belly and lower tail coverts bright yellow; axillaries, and much of the inside of the wings, white; the outermost tail-feather has a large subterminal white spot on its inner web, and the next a similar but smaller spot: bill blackish, except the base of the lower mandible, which is yellow; and feet apparently have been greenish. Inhabits Nepâl.

One or more of the following species will most probably be found to range in, or near, the present genus. 1, *Pipra squalida*, Burton, *P. Z. S.* 1836, p. 113; — 2, *Parisoma vireoides*, Jerdon, vel *Fringilla agilis* of Tickell's list, which I expect to receive in a few days; and 3, *Pardalotus pipra* of Lesson's *Manuel*, from the Himalaya, the description of which I have not seen, and which may prove identical either with *Pipra squalida*, which also is from the Himalaya, or with Mr. Hodgson's bird here described.*

Among other interesting species forwarded in the present collection from Arracan, I may just notice *Semnopithecus obscurus* of Reid, which is known to be common in the vicinity of Singapore, and should therefore be the Tenasserim *S. maurus* of Helfer; — *Tupaia Javanica*,† fine specimens (the genus *Gymnura* having been previously met with in the same province); — the *Picus canente*, Lesson, which

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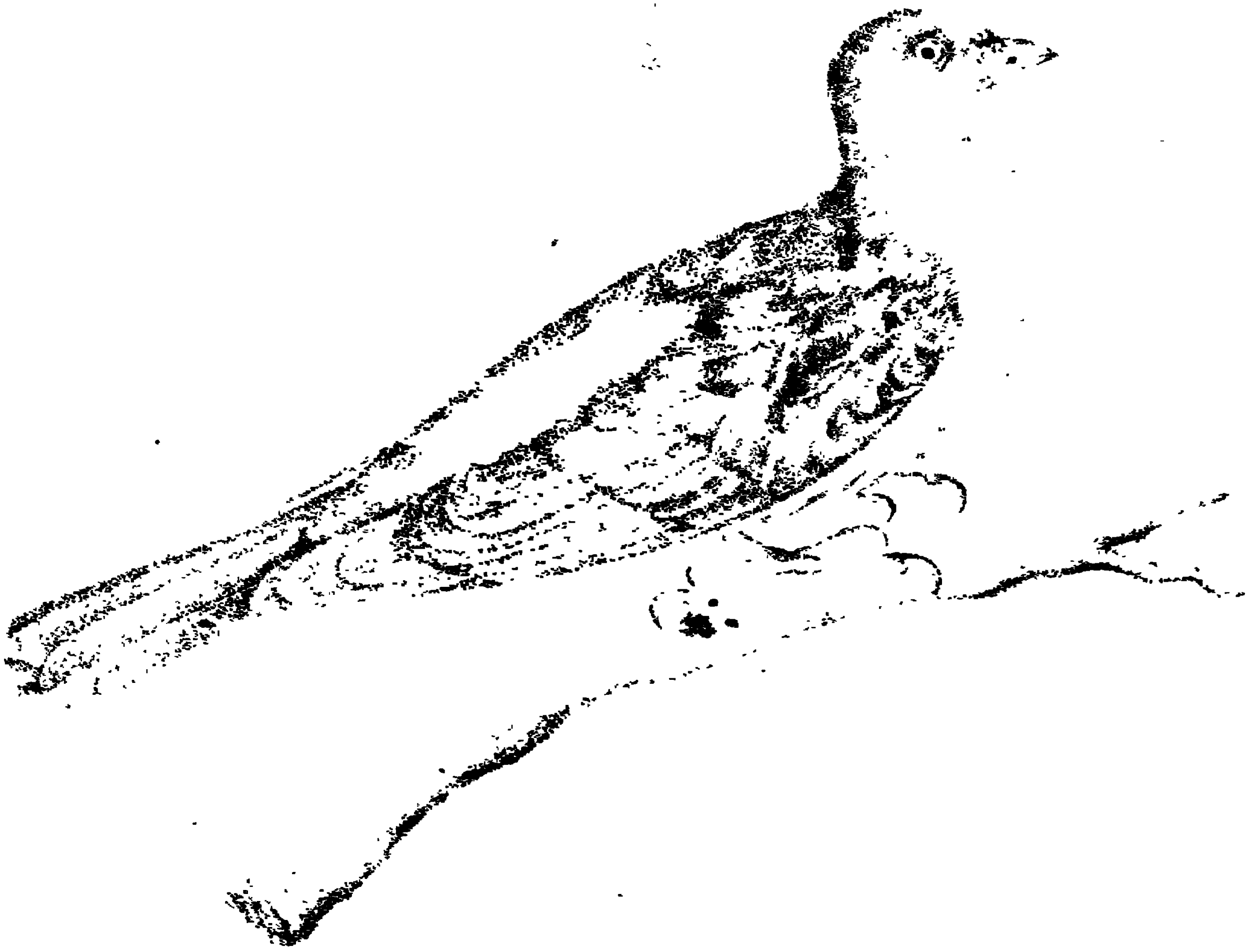
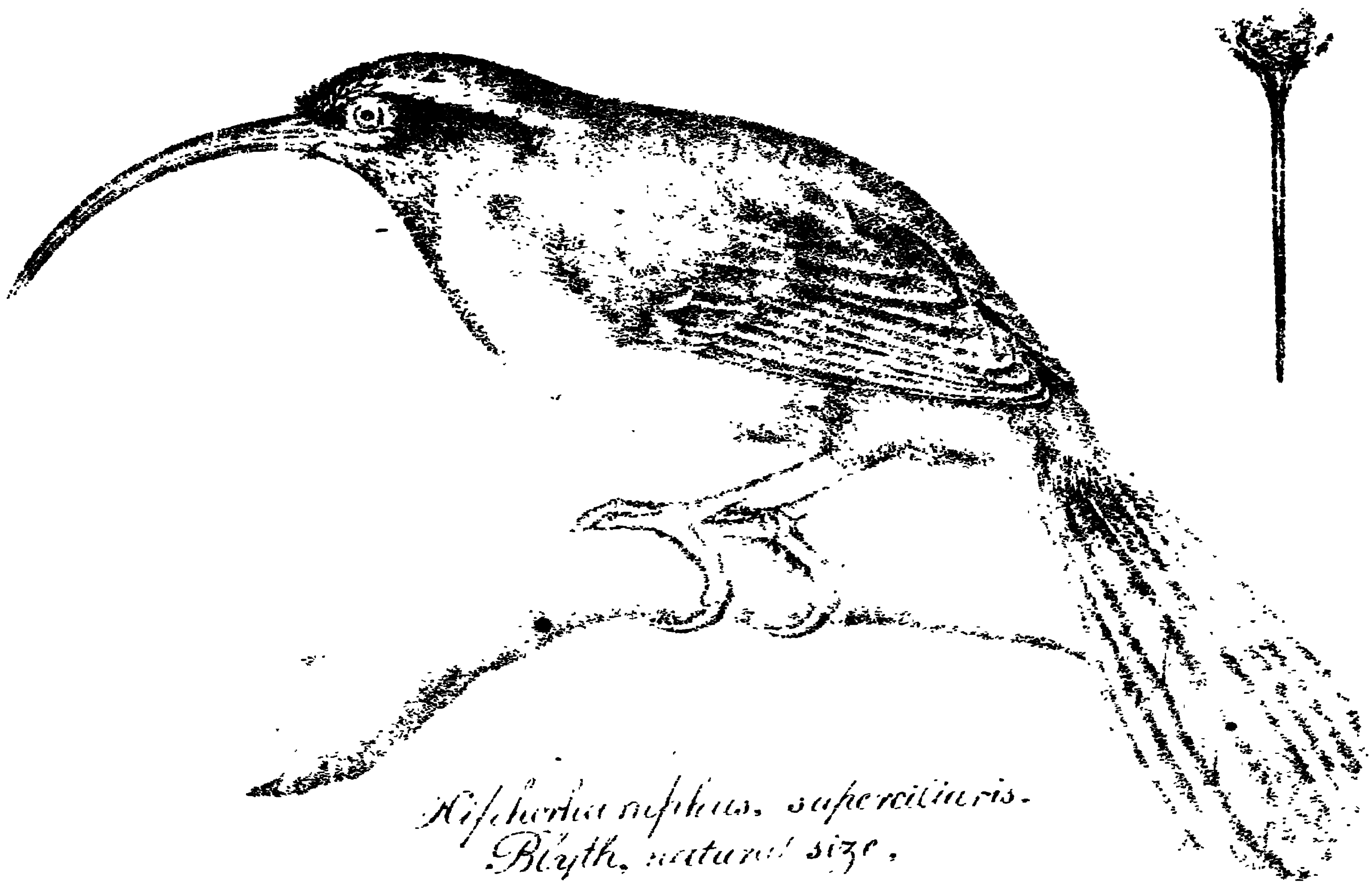
* Upon consideration, the hard-billed *Dicæum* group, comprising *Myzanthe* and *Pachyglossa* (?), appears very distinct from the soft-billed *Nectarinia* group, comprehending *Arachnothera* and *Anthreptes*, which latter subgenus might, I think, be very properly abandoned, as founded on insufficient characters.

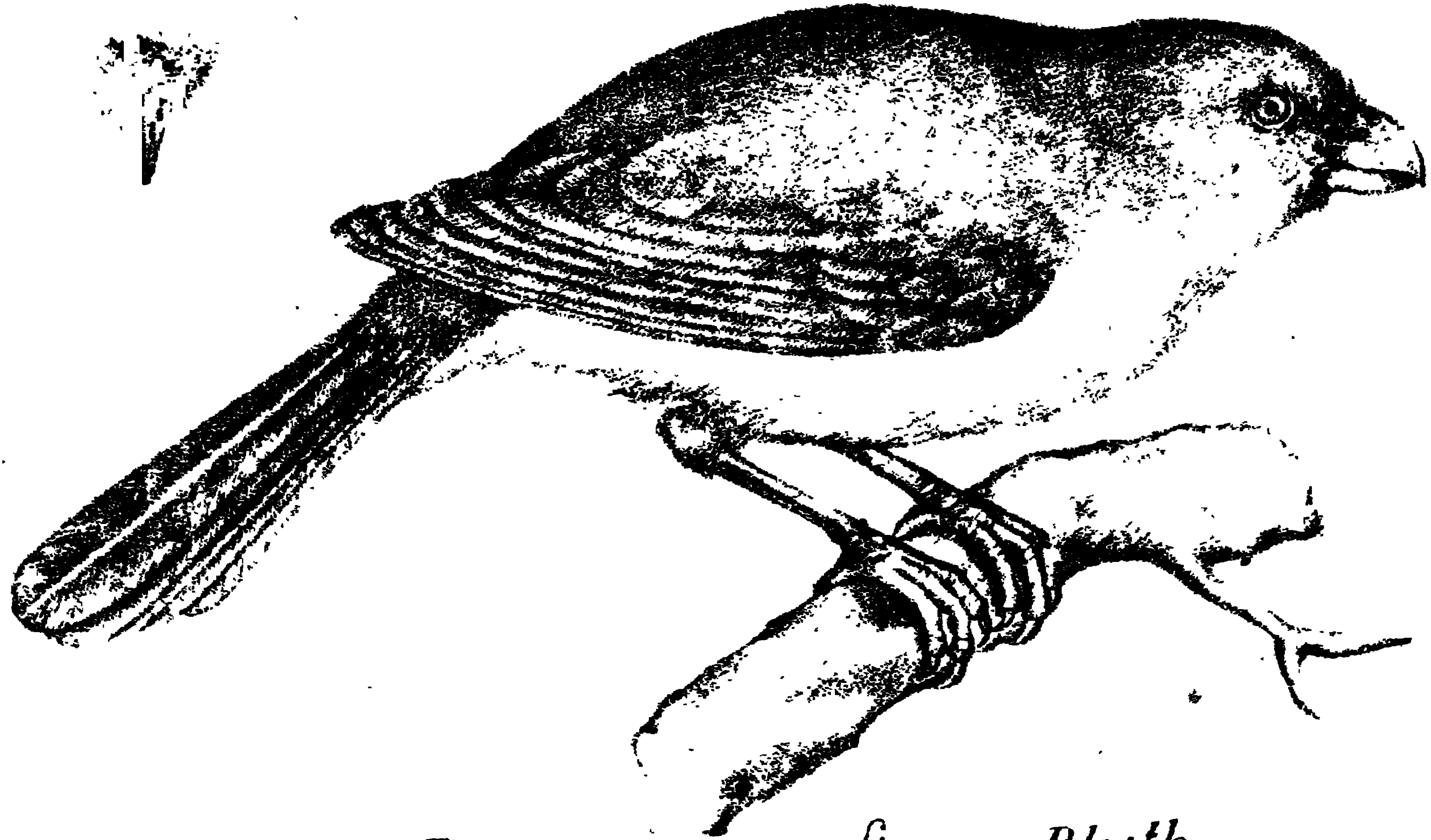
† Mr. Hodgson, to whom I exhibited a specimen of this animal, had never met with the genus in Nepâl, nor was it known to his experienced shikaree, to whom I also shewed it: but Capt. Tickell assures me, that he [illegible] recognises the genus as inhabiting Central India!



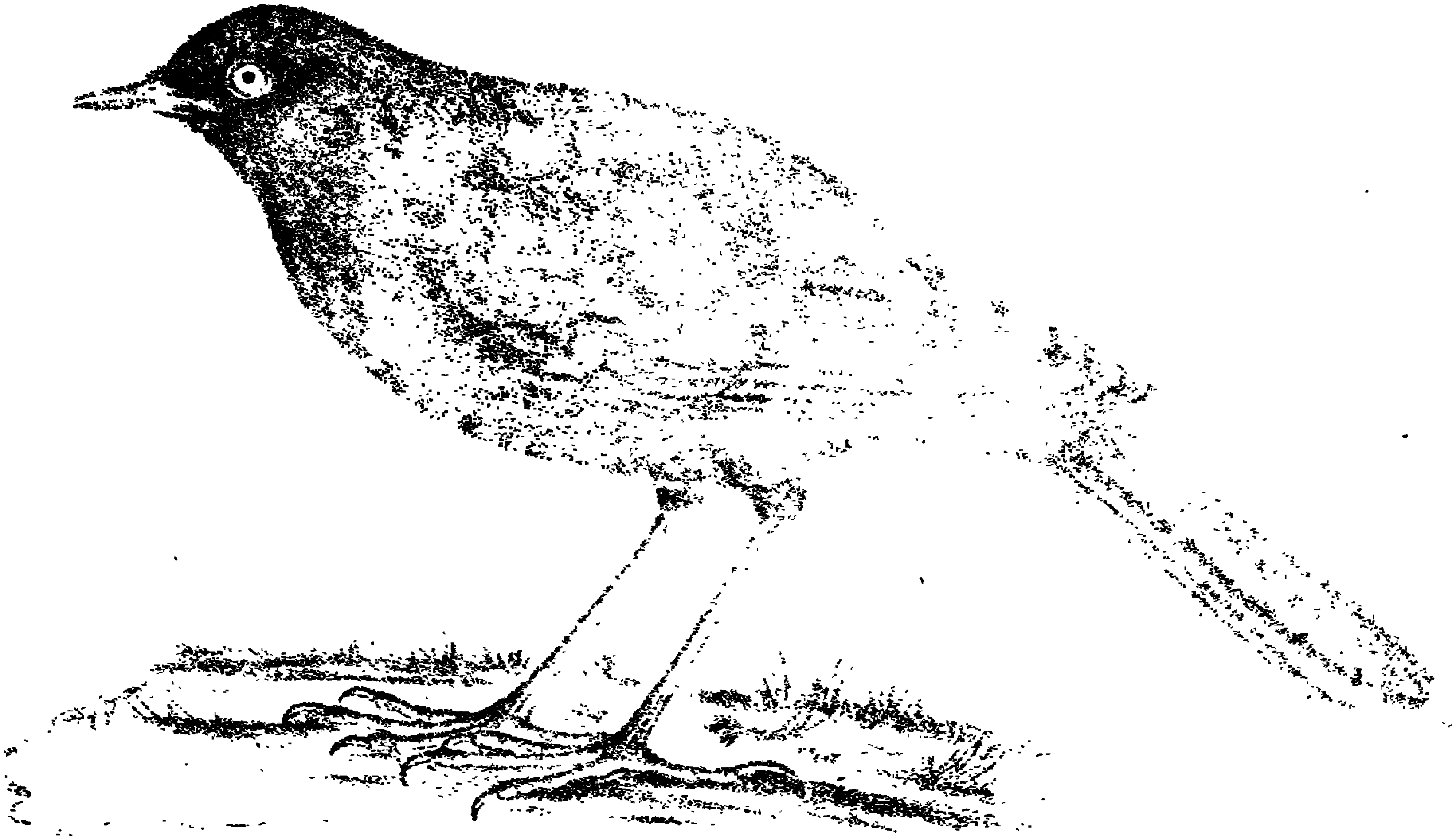
Indicator xanthonotus, Blyth;
natural size.



Xiphorhamphus superciliaris. Blyth. natural size.



Paradoxornus. ruficeps, Blyth,
natural Size.



Cinclidium frontale, Blyth,
Natural size.

ranges, with *P. cordatus*, Jerdon, (a species which the Society has received from Tenasserim as well as from Southern India), and with the Malayan *P. concretus*, Tem., in the subgenus *Hemicircus*, Swainson; —a new Partridge (*P. Phayrei*, Nobis), closely resembling in plumage the Pintado Partridge of the Mauritius (*Francolinus perlatus*), but of a less robust form, and the male armed with well developed spurs, — two fine new Herons, one of them, however, perhaps the *Ardea ardesiaca* of Wagler, &c. In previous collections, Capt. Phayre has also enriched the Society's museum with a new *Manis*, and various other interesting species.

Plates. I annex figures of *Indicator xanthonotus*, *Xiphorhamphus superciliaris*, *Paradoxornis ruficeps* (vide p 947, ante), and *Cinclidium frontale*.

Note on the Flata limbata, p. 898 et seq., ante.

In a recent communication to Mr. Blyth, Capt. Hutton remarks, of this insect, that—" This year has shewn me that I committed an error in saying that the larvæ come forth in December or January,—as I have now found them in crowds so early as the *middle of November*, and, from their size and the quantity of wax then deposited, they must have been hatched so early as the *beginning of October*. The so-called wax, is apparently a species of manna, and it certainly has much the taste of it. I want to ascertain, therefore, if it might not be useful in medicine."

In p. 898, l. 20, for "image," red *imago*.—E. B.

Proceedings of the Asiatic Society.

Wednesday Evening, 13*th November*, 1843.

The usual Monthly Meeting was held on Wednesday evening, the 13th November.

The Honorable the President in the chair.

The Bust of Mr. James Prinsep, by Chantry, (finished by Mr. Weekes,) having arrived on the *Essex*, was exhibited, and both as a work of art and a most faithful and spirited likeness, it excited the highest admiration.

R. Canthony, Esq. was balloted for, and declared duly elected.

The following new Members were proposed by the Secretary, and seconded by the Sub-Secretary.

Lieut. Hickey, 1st B. N. I., and Willis Earle, Esq.

Rev. J. Long, was proposed as an Associate Member by the Honorable the President, and seconded by the Secretary.

The following list of Books, presented and purchased, was read:—

Books received for the Meeting of the Asiatic Society, on the 1*st November*, 1843.

The Calcutta Literary Gleaner, October 1843, vol. ii, No. 8.—Presented by the Editor.

The Monthly Journal of the Agricultural and Horticultural Society of India, vol. i. and vol. ii, to No. 8.—Presented by the Society.

The Oriental Christian Spectator. Bombay. September and October 1843, 2nd series, vol. iv, Nos. 9 and 10.—Presented by the Editor.

Proceedings of the Academy of Natural Sciences of Philadelphia, March and April 1843, vol. i, Nos. 24 and 25.

The Journal of the Royal Geographical Society of London, 1842, vol. xii, pt. ii.

The Annals and Magazine of Natural History. London, August and September 1843, vol. xii, Nos. 75 and 76.

Quarterly Journal of Meteorology and Physical Science, Edited by J. W. G. Gutch. London, April 1843, vol. i, No. 6.—Presented by the Editor.

Proceedings of the London Electrical Society, Session 1842-3, vol. i, pts. vii and viii.—Presented by the Society.

The Edinburgh New Philosophical Journal, by Professor Jameson, April 1843, vol. xxxiv, No. 68.—Presented by the Author.

The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science, 3d series. London, 1843, vol. xxii, Nos. 145 and 146.

Transactions of the Geological Society of London, 2d series. London, 1842, vol. vi, pt. ii.—Presented by the Geological Society.

Journal Asiatique, ou Recueil de Mémoires, 4me. series. Paris, Janvier et Février 1843, tome i, Nos. 1 and 2.

Journal des Savans. Paris, Février et Mars, 1843.

Delessert, Souvenirs d'un Voyage dans L'Inde, exécuté de 1834 à 1839. Paris, 1843.—Presented by the Author.

Batten's Report on the Settlement of the District of Gurhwal, in the province of Kumaon. Agra, 1843.

Leach's Zoological Miscellany. London, 1814-1817, 8vo. 3 vols.—Purchased.

Gray's List of the Genera of Birds. London, 1841.—Ditto.

Gray's Spicilegia Zoologica, pt. i.—Ditto.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for the month of September 1843.—From Government.

The Grahlághava, a Treatise on Astronomy, with a Commentary, by Mallárí. Edited by L. Wilkinson. Calcutta, 1843. (Sanscrit.)—Presented by the Rev. J. J. Moore, Secretary Agra School Book Society.

The Gunitadhia, or a Treatise on Astronomy, with a Commentary entitled the Mitacshara, forming the 3d portion of the Siddhanta Shiromuni, by Bhashkara Acharya. Edited by L. Wilkinson. Calcutta, 1842, (Sanscrit.)—Ditto.

The Goladhia: a Treatise on Astronomy, with a Commentary, entitled the Mitacshara, forming the fourth and last Chapter of the Siddhanta Shiromuni, by Bhaskara Acharya. Edited by L. Wilkinson. Calcutta, 1842. (Sanscrit.)—Ditto.

Saadi, Auteur des Premiéres Poésies Hindoustani, par M. G. de Tassy. Paris, 1843.—Presented by the Author.

Bibliotheque de M. Le Baron S. de Sacy, 1 liv. Paris, 1842.—Presented by R. Merlin, Esq.

The Vendidád Sádé, by the late Fráinjí Aspandiarjí and other Dasturs. (Zend). 1842, 8vo. 2 vols.—Presented by the Bombay Branch Royal Asiatic Society.

Chart of the Comparative Readings of Eight Barometers, 1843.—Presented by Mr. Buist, in charge Bombay Observatory.

A Petition from the Widow of the late Mr. Bouchez, was presented. Referred to the Committee of Papers for report in the first instance.

The following Memorandum by the Secretary was read :—

Memorandum by the Secretary.

I have, with much regret, to report the death of the aged, and highly respected Pundit Kamalakanta Vidhyalanka, the friend and fellow labourer of James Prinsep. With him has expired the accurate knowledge of the ancient Pali and Sanscrit forms of writing; for although we now possess a key to these ancient characters, no Pundit has exercised himself in the act of decyphering to the extent to which has Kamalakanta. Like all learned persons of his class, he carefully avoided the communication of his peculiar knowledge, and latterly, having as he thought little chance of being contradicted, the old man became exceedingly dogmatical and opiniative. As I was totally destitute of that critical ingenuity and wonderful acumen which supplied in our lamented friend, James Prinsep, the want of philological accuracy, and as I had not command of the time which he could devote to the careful and patient investigation of the readings of ancient inscriptions, I soon abandoned the attempt to avail myself of Kamalakanta's services in this department. His appointment about the Society was that of Sanscrit Librarian.

He has left two wives, a married and one unmarried daughter, and a son now being educated at the Sanscrit College. His only other relative is a nephew, who has been latterly doing the old man's duties in the Library. He is an intelligent and active person, and is quite competent to conduct the duties of Sanscrit Librarian. I do not know the degree of his proficiency in Sanscrit, but he seems capable of answering all references respecting books made by parties who attend the Library. The librarian's Salary is Rs. 30 a month. I would for efficiency's sake have recommended our securing the services of a young Pundit, named Sarodha Purshâd, who also assisted James Prinsep, and has been of much help to me. He is a man of real ability and learning; but as I can always command his services, (he being employed in my office); as Dr. Roer's proficiency in Sanscrit is now acknowledged; and as the Society owes a debt of gratitude to Kamalakanta, and of respect to him as the colloborator of James Prinsep, I would propose to offer his nephew 20 Rs. a month as Librarian, reserving the other ten for a purpose I shall have in a short time the honour of subjecting to consideration.

I have also to report the demise of Mr. M. Bouchez, our head Taxidermist; regarding this appointment, I shall have the honour of reporting hereafter. I am now with Messrs. Piddington and Blyth engaged in arranging for a proper successor to the duty.

H. Torrens,

October 11, 1843. *V. P. and Sec. As. Soc.*

The appointment of Rasmohun Nayvagish, the nephew of Kamalakanta Pundit, as Native Librarian and Pundit was duly sanctioned.

The following letter from Lady Rodd, accompanying a beautiful Sévres Porcelain Medallion of Major Rennell, was read:—

To the Secretary of the Asiatic Society, Calcutta.

Lady Rodd presents her compliments to the Secretary of the Asiatic Society of Calcutta, and requests he will do her the favor to present to the Society in her name, the accompanying Medallion of her revered father, the late Major Rennell; her Ladyship had it executed at Sévres, during her late visit to Paris, by desire of the French Institute, and she feels anxious to send a copy to India, where Major Rennell's fame has ever been duly appreciated.

Wimpole Street, 17*th August*, 1843.

Read the following Letter to Government, in reference to the Volcanic Island off Cheduba, as ordered at the Meeting of October, with its reply:—

The Secretary to the Government of India, Home Department.

Sir,—By desire of the Hon'ble the President and Members of the Asiatic Society, I have the honor to request that you will be pleased to submit to Government their respectful request, that a scientific person qualified in all respects for the task be deputed at the public expence, and under the superintendence and directions of the Society, to examine and report upon the new Volcanic Island, which has appeared off False Island, near the S. E. end of Cheduba, and on the site of the valuable Copper Ore forwarded to the Society by Capt. D. Williams, from Flat Island, close to the same spot.

2. The reasons which, upon mature consideration, have induced the Society to submit to Government its opinion of the propriety of this measure, are briefly the following:—

I. The extreme interest with which phenomena of this kind are regarded by the learned in Europe, on account of their close connection with many questions both of speculative and even of practical science.

II. Their importance in a maritime point of view, as connected with the appearance and disappearance of shoals in many seas.

III. The occurrence of the phænomenon, so to say, at our own doors; whence it would be hardly creditable to the British name, were not the fullest investigation of it to take place, and be given to the world. It is barely necessary to allude to the high approbation which will on the other hand be accorded to the Government of India, if this is fully, efficiently, and creditably done, so as to satisfy the just expectations of the scientific world in Europe.

IV. Many other scientific, geological, and even national considerations might be adduced here, which the Society doubts not will readily suggest themselves upon mature consideration; but passing over these, it would farther advert to the financial and commercial interest attached to the discovery of a rich ore of Copper in this hitherto unknown locality, when its proximity to the mountains of the Aeng Pass, and other considerations are borne in mind; and (though fully aware that such views and the hopes derived from them are often fallacious,) it is evident that these are neither few nor unimportant.

V. The Society would moreover respectfully submit, that in the establishment of a Museum, (that of Economic Geology,) for the express purpose of aiding in every way the developement of the mineral resources of India, the Honorable the Court of Directors would almost seem to have anticipated that cases like the present would arise, and to have virtually expressed its desire that no such opening for the advancement of general knowledge, or the possible advantage of the state should be left unexplored . and this the more especially, when it occurs so near to the metropolis.

VI. The Society feels that the institution of the Museum of Economic Geology entrusted to their charge, under the immediate Superintendence of an Officer under their orders, but whose salary is at the public charge, entitles the Government to identify itself, when occasion offers, with those who voluntarily seek in these times the general advancement of science, and the benefit of India; and the Society would therefore, from a feeling of duty, abstain from any other course than that of informing the Supreme authority, that an opportunity existed for the practical exercise of means tending to elucidate questions of much interest and importance.

3. Impressed with these considerations, and with many more which the Society will not for brevity's sake, or cannot from its position, intrude upon the attention of Government, it has carefully made such preliminary enquiry as might obviate loss of time should the present recommendation be adopted; and the results of these is, that the services of Mr. Stephen Mornay, a gentleman who has received a regular scientific, geognostical, and practical Mining education, who holds a diploma from the Royal Mining College of Saxony, with other credentials of the most satisfactory kind, and who is also well known in Calcutta as a person of an enterprising, persevering, and energetic character, are available on a salary of Co's. Rs. 400 per mensem for whole months, or 150 Co's. Rs. per week for broken periods, and 3 Rs. per diem for his tra-

velling expences when not furnished with a conveyance by Government, by which also all contingent charges, such as the costs of surveying, those of examining mineral sites, or such as might perhaps prove to be such, collecting and conveying specimens, &c. &c. are to be defrayed. The Society would also solicit permission for an indent on the Magazine and Surveyor General's Office, for tools and scientific instruments, &c. under its inspection, and responsibility for their safe custody and due return. Mr. Mornay's time to be at the disposal of Government under the Society's directions, for any period long or short, as may be found necessary.

It presumes that this will not be thought more than a fair remuneration for the services of a gentleman of scientific attainments on a duty which must involve much personal labour and some discomfort, and which demands acquirements not commonly to be met with in India.

4. In conclusion, the Society would earnestly and respectfully urge upon the attention of Government, that opportunities combining as this does the augmentation of general knowledge and the chances of immediate benefit, and both in the same locality, but rarely indeed occur; and it is thus the more anxious that this investigation which it trusts cannot fail to redound to the credit of its promoters, should not be neglected.

H. Torrens,

11th October, 1843. *Vice President and Secretary Asiatic Society.*

No. 298.

From T. R. Davidson, Esq. *Officiating Secretary to the Government of India, to* H. Torrens, Esq. *Vice President and Secretary to the Asiatic Society, dated the 21st October*, 1843.

Home Department.

Sir,—I am directed to acknowledge the receipt of your letter, dated the 11th instant, written by desire of the President and Members of the Asiatic Society, requesting that a scientific person may be sent at the public expense to examine a Volcanic Island, which is stated to have appeared off False Island near the S. E. end of Cheduba, and explaining the reasons which have induced the Society to make this request.

2nd. The Governor General in Council considers, that there should be a Nautical Survey in the first instance of this Island; its locality and extent should be accurately ascertained, before its internal formation and character are scientifically examined.

3rd. His Lordship in Council will request the Hon'ble the Deputy Governor of Bengal to authorize an arrangement by which a Nautical Survey may be effected, and when that object has been attained, and the result reported, the adoption of further measures, with a view to the promotion of Science, will be taken into consideration.

I have the honor to be, Sir,
Your obedient servant,
Council Chamber, the 21st October, 1843. T. R. Davidson,
Offg. Secy. to the Govt. of India.

And the following from Captain Williams was also read: —

No. 1898.

Letter of Assistant Commissioner Capt. D. Williams, of 9th August 1843, with report of the native Soogree, (officer,) accompanying it.

My dear Sir,—The Soogree of Flat Island has at last been able to come to the Sudder station. He reports to me the sudden disappearance of the Island thrown up by a volcano, a few days after its appearance. It was impossible to go to *it* to obtain any of its formation. This is much to be regretted, as I see by your letter of the 7th instant, just received, that you attach importance to the subject of the volcano.

I am encouraged by your letter to submit specimens of cloth manufactured at this place; it so resembles the Scotch " Shepherd's Plaid," that I have had pantaloons made of it for wear. I should think it better adapted than the plaid, being not so warm for this country, yet warmer than jean or drill.

Dr. Andrews has sent specimens of this cloth for the inspection of Messrs. Ranken and Co. the tailors. It is made of double thread, and would be of a finer texture and stronger, if we had fresh English thread to make it with.

I also enclose for inspection a petrification of the Bela flower, (country Jessamine, or "Jasmimum Sambac,) that the natives find here, though very seldom. The petrification occurs on the shrub. I had a much finer specimen that was stolen from me a few days ago; the natives set them in gold rings; this is evidently the bud of the flower, and is petrified when in the calix. Yours faithfully,

Ramree, Arracan, 25th September, 1843. D. Williams.

P. S.—I forwarded to you by Lieut. Phayre, who has left us for Calcutta, the lumps of iron that were found with the gold coins on Cheduoba.

It was resolved, that as the Survey by the Ganges Steamer would not afford time for the researches contemplated by the Society, the Curator of the Geological and Mineralogical Department be requested to draw up such instructions, as may enable Captain Russell and his officers to collect usefully what information they can in the progress of their duties.

The Secretary presented specimens of the Type for the Tarik-i-Nadiree, of which work he stated he had so far advanced the labour of collation, that the printing of it might now commence.

Read the following Letter from Secretary to the Government of India.—

No. 40, of 1843.

From J. Thomason, Esq. *Secretary to the Government of India, to the Secretary to the Asiatic Society, dated Fort William, the 30th September*, 1843.

Foreign Dept. Secret.

Sir,—At the desire of the Governor General in Council, I have the honor to transmit to you for the use of the Asiatic Society, and for such notice in the Journal of its proceedings as may be considered necessary, the accompanying copy of Notes of a Tour taken through parts of Beloochistan in 1838-39, by Hajee Abdool Nabee, translated and arranged by Major Robert Leech, C. B. Bombay Engineers.

I have the honor to be, Sir,

Your most obedient servant,

Fort William, the 30th Sept. 1843. J. Thomason,

Secy. to the Govt. of India.

Also the following from the Secretary to the Government of Bengal:—

No. 2291.

From Under Secretary to the Government of Bengal, to the Secretary to the Asiatic Society, dated Fort William, 2nd October, 1843.

Marine.

Sir,—I am directed to transmit to you copies of the Meteorological Registers kept at Penang, for the months of April, May, June and July last. I am, Sir,

Your most obedient servant,
Cecil Beadon,
Under Secy. to the Govt. of Bengal.

The following Letter from Captain Jacob, Bombay Army, was read:—

My dear Sir,—I perceive by a letter from Mr. Piddington to the Bombay Asiatic Society, published in its last No., that your Museum of Economic Geology is desirous of information as to ores, mines, &c. on our side of India; I enclose therefore a report on the iron of the Guzerat Peninsula, published I believe by the Committee of the London Society, which devotes itself to inquiry into and improvement of our Indian resources, to whom it was sent from Bombay, but what became of the specimens that accompanied it, given to our Bombay Geological Society, I know not; if these are desiderates, I can easily supply a fresh collection on my return.

From my long silence, I fear you will have thought me very ungrateful for your Journal duly received. Last month I sent you a budget on the Girnar Inscriptions, which I trust has reached; intense official occupation, (in Kattywar we have two men to look after twenty-two thousand square miles,) and severe illness, have stood in the way of my usefulness; the first cause has ceased, but the other remains.

Yours, my dear Sir, very truly,
Ootacamund, 11th November, 1843. E. Jacobs.

Read the following from Captain Hannyngton, Purulia, addressed to the Sub-Secretary.

My dear Sir,—I am extremely obliged to you for the trouble you have taken about the Mortality Table, and also for the perusal of Major Henderson's valuable Paper, which I return by this day's post.

If you can procure, and will publish, Mr. Prinsep's Table, the purpose for which I wanted it will be fully served.

I send you a Memorandum, which I have drawn up respecting Mortality among the Military. There are a few Tables to which I have prefixed a few explanatory remarks. I have abstained from any *practical* deductions, as they would hardly fall in with the scientific nature of your Journal, in which perhaps you may think fit to publish them. Should the Paper as it is, be thought unsuitable, you may reject it without ceremony.

I am, my dear Sir,
Purulia, October 5, 1843. Yours very truly,
J. Hannyngton.

Captain Hannyngton's very valuable Tables will be printed in the Journal, and in an early number.

Read the following Letter from our new and zealous associate Dr. Sprenger:—

To the Secretary of the Asiatic Society of Bengal.

Dear Sir,—The Asiatic Society is in possession of two copies of Abdur-Razzak's Dictionary of Suffitic terms, which being rather scarce, and the completest work of the kind, might deserve to be published; and if the Society should deem it worthy of being edited, I should with great pleasure undertake the task. I am fully aware of the objections which can be raised against the work. Sufiism is not much studied, neither here nor in any other part of India, and the merit of the work is perhaps not so great as it might be expected. With reference to the first objection we may answer, that it is a duty for us, as we are nearer the source, to furnish European scholars who have done so much for India, with materials: and Tholuck's work De Sufiismo; Garcin de Tassy's most elegant book, entitled Les Oiseaux et les Heures, "Gehmölder's" Specimen de Philososophia Arabum, Rosenzweig's magnificent edition of part of "Jeláled-din Rum," and Ruckert's highly poetical version of other portions of the Mesnewi, are not only proofs that Sufiism is studied in Europe, but that they find very great difficulties in explaining technical expressions, most of which they might find without loss of time in Abdur-Razzak's Dictionary. As to the merit of the work, I may repeat what I have already stated: a Dictionary of Sufitic terms is very desirable, and this is the best book known on the subject, it is therefore the more desirable that it should be edited, as no European collection of MSS. is, to my knowledge, in possession of a similar work.

The work itself is very small, and would hardly fill one hundred pages, if the Arabic text alone was printed, which I should think best to do. The expense would therefore be very trifling.

I am, dear Sir,
Your's most respectfully,
A. Sprenger.

The work upon this recommendation was ordered to be printed forthwith under Dr. Sprenger's kind superintendence, and the best thanks of the Society were accorded to him for his suggestion.

Calcutta, 1st November, 1843.

Read a letter from Mr. J. T. D. Cameron, accompanying the Model to which it refers.

To H. Torrens, Esq. *Secretary to the Asiatic Society, Calcutta.*

Sir,—I have the honor to forward per bearer, a specimen of the Ferry Boats commonly used in Ceylon.

The European residents of the Island call them Out-riggers, from the outer work attached to the boat, which is intended to balance it. The craft used by the native fishermen are much larger, but similarly built.

Should you think the specimen deserving of a place in the Museum of this city, I beg to say it is entirely at your service. I am, Sir, yours obediently,

La Martiniere, 24th October, 1843. J. T. D. Cameron

From the Rev. J. J. Moore, Secretary Agra School-Book Society.

No. 114.

To the Secretary of the Asiatic Society, Calcutta.

Sir,—I beg to present, for the acceptance of the Society, copies of two celebrated Sanscrit works on Astronomy, published under the patronage of the Agra School Book

Society; and since the death of the late Resident of Sehore, completed under my supervision.

I have the honor to be, Sir,
Your most obedient servant,
Agra, 12th October, 1843.
J. J. MOORE,
Secy. Agra School Book Society.

The type and general execution of these Books were considered as most creditable to the Agra School-Book Society's Press and to the Editors.

Read the following letters from the Bombay Branch Asiatic Society.—

To the Secretary of the Asiatic Society of Bengal, Calcutta.

SIR,—Under the instructions of the Bombay Branch of the Royal Asiatic Society, I have transmitted for the Library of the Asiatic Society of Bengal, by Capt. Noakes of the Ship *Samuel Boddington,* a lithographed copy, in 2 vols. of the Vendidad, in the Zend language, but Gujarathi character, with a Gujarathi translation, paraphrase, and comment, by Aspandiarjí Framjí and other learned Dastúrs of the Kadmí sect of Parsees. Of this work the Society has had 25 copies lithographed at an expense of upwards of Rupees 1,000, with the object of preserving a work now become rare in manuscript, and of distributing it amongst the principal libraries of Europe and Asia. I shall be happy to receive an acknowledgment of the receipt of the work. The Society have also directed the Jzashné and Vispárád, which compose the doctrinal standards of the Parsí faith, and the larger liturgy in use among the Zoroastrians, to be printed, which will be forwarded as soon as ready.

The MSS. from which these works are copied, are in possession of the Rev. Dr. John Wilson, late President and present Honorary President of the Society.

I have honor to be, Sir,
Your most obedient servant,
Bombay Asiatic Society's Rooms, 7th Sept. 1843.
JOHN G. MALCOLMSON,
Secretary B. B. R. A. S.

To H. TORRENS, ESQ. *Secretary to the Asiatic Society of Bengal.*

SIR,—I am directed by the Bombay Branch Royal Asiatic Society, to request that you will have the goodness to order the following works to be sent to Messrs. Thacker and Co., for transmission to the Library of our Bombay Society, along with some works ordered from them. I have requested Messrs. Thacker and Co. to pay yourself, or the Treasurer of the Asiatic Society, the price of these works, as advertised on the cover of the Journal of your Society.

The Mahabarata in Sanscrit, 4 vols. (large paper.)
Harriwansa, (royal 4to.)
Raja Tarangini, (large paper.)
Naishadha, (4to.)
Raghavansa.

I have the honor to be, Sir,
Your most obedient servant,
Bombay Asiatic Society's Rooms,
6th September, 1843.
JOHN G. MALCOLMSON,
Bombay B. R. A. S.

The present of the rare work alluded in the first letter was duly appreciated by the Members, and in reference to the order contained in the last letter, the Secretary stated, that he had taken upon himself, pending the approbation of the Society, to present to the B. B. A. S. the works desired by them, which was fully approved of.

Read the following Letter from Moulmein :—

H. TORRENS, ESQ. *Secretary to the Asiatic Society.*

SIR,—I am desired by the Committee to apprise you of the formation of an Horticultural and Agricultural Society at this station, connected with which will be a Museum of the Natural History of these provinces, so soon as the funds of the Society will admit of the erection of a building for the reception of specimens; in the meantime, they are anxious, as a commencement, to open a correspondence with your Society, and trust it will be reciprocated. I have the honor to be, Sir,

Yours very obediently.

Moulmain, 12*th October*, 1843. G. R. GORDON,

Hony. Secy.

The Secretary was requested to state that the Society would have much pleasure in forwarding the views of that at Moulmein in every possible way.

Read Letter from the Hon'ble Company's Astronomer at Madras.

From T. G. TAYLOR, ESQ. F. R. S. *and* F. R. A. S. *Hon'ble Company's Astronomer, to* H. TORRENS, ESQ. *Secretary to the Asiatic Society.*

SIR,—With reference to an application lately made by your Society to the Governor General of India to be supplied with the Meteorological Observations made at the Madras Observatory, at the Tidal Stations, and at the Magnetic Observatories, I am desired by the Most Noble the Governor in Council at this Presidency, to place myself in communication with you upon this subject, and to furnish the Asiatic Society with whatever observations you may desire; to this end I have the honor to state,

1st. That the Meteorological Observations made at the Madras Observatory, from their commencement in 1795 up to the end of 1822, are printed in a work entitled "Madras Observatory Papers," copy of which it appears has been furnished to the Asiatic Society

2d. The Meteorological Observations made at this Observatory since 1822, and up to the end of the present year, are now in the course of publication, and a copy will be forwarded to the Asiatic Society on its completion.

3d. The Meteorological Observations at the Magnetic Observatories being made at odd hours and minutes of Göttingen mean time, and bearing reference to certain corrections which may be necessary to the Magnetic Observations, rather than to any Meteorological enquiry, are not as a *whole* of that strict character, to entitle them to the name of a Meteorological Register; selections from these, however, with certain explanations and corrections, will eventually be published.

4th. With regard to the Meteorological Observations made at the Tidal Stations, it is proposed that their publication shall be undertaken as soon as two complete years' Observations at each station has been obtained, when the Observations will altogether be discontinued.

5th. Since the whole of the Meteorological Observations asked for by your Society will in all probability be in print in the course of a twelve month, I have delayed for the present forwarding any manuscript copy; in case however any more immediate information should be desired, I shall be prepared without delay to forward your wishes.

I have the honor to be, Sir,

Your most obedient servant,

Madras Observatory, 26*th September*, 1843. T. G. TAYLOR,

Hon'ble Company's Astronomer.

Read Letter from Colonel Spiers, Resident at Gwalior, &c &c.

To H. PIDDINGTON, ESQ. *Sub-Secretary to the Asiatic Society, Calcutta.*

DEAR SIR,—When on furlough, I picked up a few geological specimens of various kinds, chiefly limestone from Stirlingshire, Scotland, a few specimens of copper ore from Ireland, and lead from Lanarkshire, with some of various kinds, probably not marked, at least not to be trusted; in all perhaps 50 specimens. If you think they would be of any use in the Museum of Geology, I shall be happy to send them down by some boat. I happen also to have 5 or 6 coins, one of Sigismund III, one James VI, one Clot 1602, 1 ditto 1582, one Hamburgh, and one ditto James 1570. If you think these would be valued, I will be happy to send them also. Your obedient servant,

Cawnpore, 23d September, 1813. A. SPEIRS.

Read the following Letter to the Secretary from Captain Eastwick :—

To the Secretary of the Asiatic Society of Bengal, Calcutta.

MY DEAR SIR,—I received a day or two ago, your kind note regarding the publication of my Sinde Vocabulary, and am much gratified by the flattering manner in which my endeavours have been mentioned. I returned to England in June, on sick certificate. With respect to the 25 copies of the Vocabulary reserved for me, I should be highly obliged, if you would order them to be transmitted to Messrs. Forbes and Co. of Bombay, who are my Agents in India, and who will take care of them for me

I am, dear Sir,
Yours truly,

Frankfort sur Maine, August 17, 1843. E. B. EASTWICK.

The Secretary stated, that Captain Eastwick's copies had been sent to Bombay through the Government, but that Messrs. Forbes would be written to, in order that they might claim the packet if not already delivered to them.

Read the following Note from Dewan Ramcomul Sen, who had kindly undertaken to examine the Sanscrit paper on Eclipses, presented at a former meeting of by the Rev. J. Pratt.—

The bad state of my health has hitherto prevented my writing to you about the accompanying paper, which I have now the pleasure to return. It is styled "Grahuno Mala," or Garland of Eclipses, and has been prepared I believe by some Astronomer of Nepaul. It professes to give an account of Sun and Moon Eclipses for six years; viz. from the year 1759 to 1766 of the Sak era. It does not, however, shew any calculation or data by which the problems are solved. Following is a Table of the Eclipses:—

Sak, 1759, (or Sumbul 1894,)—	1 Moon Eclipse.
1760,	1 Ditto ditto.
,,	1 Ditto ditto.
1761,	1 Ditto ditto.
,,	1 Sun ditto.
1763,	1 Moon ditto.
1764,	1 Sun ditto.
1765,	1 Ditto ditto.
,,	1 Moon ditto.
1766,	1 Ditto ditto.
,,	1 Ditto ditto.

Year, month, age of the Moon, the day of the week, the hour it began, the position occupied, and its duration, are stated.

29th October, 1843.

The paper was not considered as worth printing, as being for so very short a period, and the number of cuts considerable.

Read the following Letter from Major Hough, accompanying the Life Preserver to which it refers:—

To H. TORRENS, ESQ. *Secretary to the Asiatic Society of Bengal.*

SIR,—I do myself the honor to transmit, for submission to the Asiatic Society of Bengal, a "Cloth Life Preserver," which is so portable and cheap, as to render it very useful to all individuals, whether on board of Ship, or on board of Boats in any river.

I have the honor to be, Sir,
Your obedient servant,
W. HOUGH, *Major*.

Calcutta, 24th Oct 1843.

P. S.—A description of the "Life Preserver" is annexed to this letter:—

Description of the "Cloth Life Preserver."

It is made like a Jacket without sleeves, composed of two pieces of cloth sewn together, so as to form the front and back. There being two cloths to each, the space between the two is easily inflated by means of the wooden tube placed in the front, by blowing into it. It can only be inflated when the cloth is wet. The tapes, above and below, which pass through the loops, are meant to fasten the Life Preserver round the neck and waist. When inflated, it will float any man—for, in proportion to the bulk of a man's body, must the size of the Life Preserver be increased. It is in use in the British Army at Home, and its cost is about one shilling. A cork, or piece of wood, and a piece of string, or tape, should be attached to the tube, as a stopper; to prevent the egress of air, or of the ingress of water.

The Americans have rendered all kinds of furniture "Life Preservers" on board of Steamers; but, I do not find any so personally useful as that I submit, since the user can swim with it to land, &c. It is also available to travellers generally, having to cross rivers, &c., being portable. It is superior to the "Chinese Bamboo Life Preserver," and is better and cheaper than the "Air-tight Hats and Caps," which cost 16 to 14 Rs. and are too costly for the Private Soldier, or those in the lower ranks of the people. It can be renewed, at pleasure, while there may be difficulty in procuring an adequate supply of Hats and Caps; and even Bamboos may not always be procurable. The "Cloth Life Preserver" is admirably adapted for "Regimental Swimming Parades;" and may, annually, save the lives of many men, women, and children, both European and Native.

Read the following Letter accompanying the valuable paper to which it refers:—

H. TORRENS, ESQ. *Secretary to the Asiatic Society.*

MY DEAR SIR,—I have the pleasure to send you a sketch of Aracanese History. You will be able to judge whether it is of sufficient interest to lay before the Society, a point which from my Aracan bias I feel uncertain about. Yours very truly,

A. P. PHAYRE.

This most interesting communication was handed to the Editors, for early insertion in the Journal.

The Secretary also presented on the part of the Rev. J. Long, who was present, a valuable Essay, entitled "Tables of Comparative Philology, shewing specimens of the affinity of the Greek, Latin, and English with the Sanskrit, Persian, Russian, Gaelic, Welsh, Lithuanian, German, Hebrew, and Anglo-Saxon," which, as it was desirable to secure the Author's supervision, was also ordered for early publication, the subject being one of intense interest to Indian and general Philologists, and one that requires a rare combination of learning, talent, and industry, to undertake.

Read the following Letter from G. Buist, Esq. The Barometrical Chart to which it refers, was exhibited, and much admired :—

My dear Sir,—A thousand thanks for your attention in forwarding me the Barometer Returns for the May Storm. I do not know that I shall have any more occasion to trouble you on this subject for the present, but should I require to do so, I shall avail myself of your kind offer of services.

I have this day shipped on board the *Samual Boddington*, three copies of a Diagram illustrative of the readings of nine Barometers, being up together for 24 hours, and read half hourly. One of these is for the Asiatic Society, the others for yourself, or any one else who may care about them. The Society's is the only one which is coloured, and put on a roller: the most simple operation of this sort is so expensively, so tardily, and so badly done at Bombay, that I have left them plain ; so that should you think it worth while, they may be filled up to your fancy at Calcutta.

I am anxious to see your Memoir :—it is published I observe, but has not yet reached Bombay,

I forgot to mention, that a short Memoir, referring to the Barometric experiment, appears in the next number of the Bombay Asiatic Transactions, of which I shall send you a copy, so soon as it is printed.

Yours truly,
Bombay, September 6th, 1843.
George Buist.

P. S.—In case the Maps should not be sent to you, perhaps you will take the trouble of sending for them to the office of Messrs. Gisborne and Co. on the *Samuel Boddington's* arrival.

Report of the Curator Museum Economic Geology for the month of October.

Museum Economic Geology.—We have to acknowledge in this month from the Bombay Branch Royal Asiatic Society, a box of Geological and Mineralogical Specimens, 35 in number, all of much interest and utility, and for the most part so far new to our Collections, that we only possessed small specimens of some of them. Another box has been announced by the Society. As the Catalogue is brief, it may be inserted here with the letter.

To the Secretary of the Asiatic Society of Bengal.

Sir,—With reference to my letter of the 5th ultimo, I have now the pleasure to enclose a list of the Geological and Mineralogical specimens forwarded for the Museum by the *Fazal Rubany.* These specimens are necessarily miscellaneous, as they consist of duplicates put aside for your Society, in the course of the new arrangement, now in progress, of our Collection. Still some of them will, I think, be of interest, if not in the higher and scientific department of your Collection, at least in that of Economic Geology. The specimens of the Bombay Basalt, I request may be presented in my own name, and if more specimens of the Minerals they contain are required, I shall endeavour to procure them.

Another case will be dispatched in a few weeks. I have the honor to be, Sir,

Your most obedient servant,

Bombay Asiatic Society Rooms,
22nd Sept. 1843.

John G. Malcolmson,
Secretary B. B. R. A. S.

List of Specimens forwarded.

No. 1 to 6. Specimens of iron ore from Malwan, in the Collectorate of Rutnagherry. See Journal of the Bombay Branch Royal Asiatic Society, No. III, and Geological Transactions, Vol. V, page 548. The rock in which this fine ore is found, is stated to be sandstone, I think by mistake.

— 7 „ 9. Building stone from the ruins of Mandoo, the Ancient capital of Malwa. The fine reddish sandstone abounds with minute corals, and I have also found in it marine shells. Many of the finest buildings are composed of this.

— „ 10. Selenite. Persian Gulf?

— „ 11. Lithographic limestone (so called); southern Mahratta country. See Capt. Jervis' and Capt. Newbold's Papers in Journal of Asiatic Society of Bengal, Dr. T. Christie, in Edinburgh Journal of Science, and Geological Transactions, Vol. V, plate 46.

— „ 12. Argillaceous limestone. South Mahratta country.

— „ 13. Common ditto, (Kullajee,) ditto.

— „ 14. Calc spar in argillaceous limestone, ditto.

— „ 15. Limestone, ditto,

— 16 „ 17. Diamond sandstone, near Belgaum, ditto. It is not known that diamonds are found in this rock. It is so called from its relations and mineralogical characters being that of the diamond matrix.

— „ 18. Diamond sandstone. Kowlgere, Dharwar S. M country,

— „ 19. Laterite, ditto.

— 20 „ 21. Gypsum from Persian Gulf. This was imported in some quantity intended to be used as stucco.

— 22 „ 25. Rock of which the Maldive Islands are formed, collected by Capt. Moresby, I. N. See Darwin on Coral Reefs. The complete collection in the Bombay Museum is perhaps unequalled.

— „ 26. Iron stone from Segoor, 15 miles north of Dharwar, South Mahratta country.

— „ 27. Iron ore used at the native foundries, Mahableshwur hills.

— „ 28. Painted plaster of the baths of Aurungzeebe's palace, Aurungabad, by J. G. Malcolmson, Esq.

— 29 „ 30. Granite from bed of Nerbudda near Mhysur. See Major Stirling's letter, Bombay Geographical Society's Journal. This granite rises in the middle of the basalt, and is cut by basaltic dykes.

No. to 31. Basalt, Mazagon Quarry, Bombay. Occurs in columns and balls. Is extensively used in the erection of the ship-building slips and wharfs in Bombay and Colabah. This specimen contains Laumonite and Prehnite. Presented by J. G. Malcolmson, Esq.

— ,, 32. Ditto ditto, with Laumonite and Calcspar.

— 33 ,, 34. Ditto ditto, with Apophyllite.

— ,, 35. Basalt, from the hot springs of Rajapoor, Southern Concan. This specimen was coated with coating resembling Pyrites, probably from Hydro-Sulphureous water on the iron of the basalt.

John G. Malcolmson,
Secretary, B. B. R. A. S.

Mr. Pyle of Futtegurh, to whom I addressed one of our circulars, sends us a box of specimens of a peculiarly interesting kind, being mostly the products of his own manufacture from materials near that station.

No. 76.

H. Piddington, Esq. *Calcutta.*

Sir,—I beg to apologize for not having answered your letter earlier. I have now the pleasure of sending the following products of Upper India by the hands of Mr. E. Fricker, who has engaged to deliver them over to you.

Pottery.—No. 1. A specimen of Earth, for making superior ware when mixed with

No. 2. Of which a specimen is also sent.

No. 3. Stone-ware Bottles made at Futtegurh, of the above Earth.

Crucibles.—The Earth marked No. 1, when properly manipulated is capable of forming Crucibles, which will withstand the most intense heat of a bellows furnace.

Fire Bricks.—No. 4. Fire Bricks made at Futtegurh.

No. 5. Soda Sub Carb. made at Futtegurh.

No. 6. The Earth from which the Soda is made.

No. 7. Dark green Glass from river sand and the above Soda, with certain additions.

No. 8. Light green Glass made from the above Soda, with certain additions.

No. 9. Citrate of Lime for the manufacture of Citric Acid.

Your obedient servant,

Futtegurh, 11*th September*, 1843 John E. Pyle.

Our indefatigable correspondent, Captain Shortrede, sends us a specimen of a supposed Lithographic Stone, of which his account is as follows:—

To H. Piddington, Esq. *Curator Museum Economic Geology, Calcutta.*

Sir,—I have the honor to inform you, that I have despatched to your address for the Museum of Economic Geology, by the Steamer *Luckia*, a package containing a slab of Stone from the neighbourhood of Rewa, which I apprehend may be found useful for Lithographic purposes.

I have sent two pieces; the smaller of which may serve as a hand specimen, and the larger for Lithographic experiment.

There are some quartzy veins which probably may render this particular slab of no great value, but if the stone be otherwise fit for Lithography, it seems desirable to bring it to notice.

Mu.

The locality from which this stone was brought is a hill at the small village Boorhwa, two miles S. E. from Raipoor, about twelve miles from Rewa on the road towards Mirzapoor.

On the top of the hill are the ruins of a temple of Devi, and a large pile of undressed stones, which seem as if they had been intended for the foundation of a flight of steps. They are laid without mortar, and the work has never been completed. The present slab was found lying loose at the bottom. The whole pile is of the same sort of stone, but a few slabs of sandstone have been used in building the temple. I did not ascertain the particular spot from which the pile has been quarried, but I believe it to be in the immediate neighbourhood, if not on the hill itself. This might easily enough be ascertained, should it appear that the enquiry would be worth the labor.

Some of these stones may be used as whetstones, and though not very good ones, they seem quite as good as many that are supplied from the public stores.

I have the honor to be, Sir,
Your most obedient servant,
Allahabad, 10th October, 1843 Robert Shortrede, *Capt. 1st Ass*[illegible]. *T. S.*

Of these two stones, I regret to say, that the larger appears quite unfit for Lithography, being nothing more than a common fine grained (coarse grained for lithographic purposes) sandstone. The small slab was sent to Messrs. Black, as it promised better, and their answer is as follows :—

H Piddington, Esq.

Sir,—I have pleasure in sending a few impressions, and the stone you sent me the other day; I have not troubled Mr. Bennett. The stone I find is rather too soft, and I fear will not give very clear impressions; but if a somewhat larger piece could be obtained, I would try how many fair proofs could possibly be taken from it.

Your obedient servant,
Asiatic Lithographic Press, 31*st Oct.* 1843. T. Black.

Mr. Thomas Hugon, of the Salt Department, has presented a very beautiful lithographed section of the Boring of the Artesian Well of Grenelle near Paris, 1680 French feet deep, and I may mention here, that we fortunately possess a series of the Fort Borings to the depth of 172 feet.

Geological and Mineralogical Department.—Mr. Dodd, Assistant Assay Master, has obliged us with a few well chosen Geological specimens from the neighbourhood of Agra, of much interest in themselves, and of special utility to us in filling in our Cabinets of Comparative series.

From M. Gros of Bourbon, we have received a few specimens of Lavas, and Lava with Leucite, from the Volcano of that Island, which will be a valuable addition to our Volcanic series.

For all the foregoing Communications, the thanks of the Society were duly ordered.

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